Vol. 1037 Number 2

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

December 13, 1983 Volume 1037 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Dec. 3, 1982.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,331,045, Re. S.N. 537,644, Filed Sept. 30, 1983, Cl. 74/867, PNEUMATIC CONTROL SYSTEM FOR AN AUTOMATIC VEHICLE TRANSMISSION, Ferdinand Piech, et al., Owner of Record: *Volikswagenwerk Aktiengesellschaft, Wolfsburg, West Germany,* Attorney or Agent: Granville M. Brumbaugh, et al., Ex. Gp.: 352

4,374,597, Re. S.N. 530,257, Filed Sept. 8, 1983, Cl. 292/8, REMOTE CONTROL ARRANGEMENT, Haruo Mochida, Owner of Record: *Nissan Motor Co., Ltd., Yokohama City, Japan,* Attorney or Agent: Arthur Schwartz, Ex. Gp.: 351

4,394,159, Re. S.N. 530,633, Filed Sept. 9, 1983, Cl. 71/98, 2-CHLORO-3-(PHENOXY OR PHENYLTHIO) 6-(6-) NITRO ANILINES, Wolfgang Buck, et al., Owner of Record: *Celamerck GmbH Co., Rhein, Germany,* Attorney or Agent: Walter G. Weissenberger, Ex. Gp.: 113

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue

Patents Available for License or Sale

3,620,043. SPLINE-TYPE PIVOTS, UNIVERSAL JOINTS AND FLEXIBLE COUPLINGS. *James A. Oliff,* Parkhurst & Oliff, 277 So. Washington St., Alexandria, Va., 22314, 703-836-6400.

3,832,965. SUBMERSIBLE TRANSPORT APPARATUS. *Paul J. Walker,* P.O. Box 2769, Nipawin Saskatchewan, Canada SOE IEO.

3,847,139. DEVICE FOR AID IN DETECTING BREAST CANCER. *Eric Flam,* 29 Ainsworth Ave., East Brunswick, N.J. 08816.

3,982,332. SPEED READING AID AND METHOD. Correspondence to: *Lusthoff & Brendemuhl,* 2914 S. Harlem Ave., Box. L., Riverside, Ill. 60546.

4,004,501. TACO HOLDING TRAY. *Lois L. Guerrero,* 84 Pukihae St., Bayshore Tower, Hilo, Hawaii, 96720.

4,136,764. MOTHER ALICE'S BREAD VENDING MACHINE. *Alice Johnson,* 8650 Belford Ave. #1, Los Angeles, Calif. 90045.

4,193,375. A FLOOR PROTECTING DOOR PAINTING SHIELD. *Stan Sharland,* 12322 Quartz Pl., Garden Grove, Calif., 92643. (714) 636-6127.

4,302,883. EXACTO-MAC. *Exacto-Mac Ltd. Partnership,* c/o Thompson, Weir & Barclay, P.O. Box 2044, New Haven, Conn. 06521.

4,304,276. ROUTER TABLE FOR CUTTING LAMINATED PLASTICS, Correspondence to: *Benasutti and Murray,* 1020 Suburban Station Bldg., 1617 John F. Kennedy Blvd., Philadelphia, Pa. 19103.

4,357,137. SHAFT COUPLING. *James A. Oliff,* Parkhurst & Oliff, 277 So. Washington St., Alexandria, Va. 22314. (703) 836-6400.

4,376,152. CRIMPED THERMOPLASTIC FILAMENT. *Robert A. Bennett.* Correspondence to: F. Eugene Davis, IV, 30 Oak St., Stamford, Conn. 06905.

4,376,162. CRIMPED THERMOPLASTIC FILAMENT. *Robert A. Bennett.* Correspondence to F. Eugene Davis, IV, 30 Oak St., Stamford, Conn. 06905.

4,377,727. STETHOSCOPE HAVING MEANS FOR MEASURING PULSE FREQUENCY. Correspondence to: *Joseph C. Schwalbach,* 1010 Second Ave., Suite 1607, San Diego, Calif. 92101.

4,392,006. SOLAR-CELL ACTIVATION SYSTEM. *Lawrence Apelian,* 51 So. Coleman Rd., Centereach, N.Y. 11720.

The following patents are offered by Terence G. Hare, Sr., 21146 Caberfae Hwy. 55, Wellston, Mich. 49689.

3,948,372. CENTRIFUGAL CLUTCH.
3,994,095. SAFETY WINDOW.

4,377,215. SUSPENSION SYSTEM FOR AUTOMOTIVE VEHICLES.

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: Patent Counsel, Aerospace Control Systems Dept., General Electric Co., P.O. Box 5000, Binghamton, N.Y. 13902.

4,366,476. RASTER DISPLAY GENERATING SYSTEM.

Applications for license may be addressed to: General Electric Co., Component Products Group, 1635 Broadway, P.O. Box 2204, Fort Wayne, Ind. 46801–2204. Attention: Patent Counsel.

3,872,705. APPARATUS FOR MANUFACTURING SLOTTED CORE STRUCTURES.

4,308,479. MAGNET ARRANGEMENT FOR AXIAL FLUX FOCUSSING FOR TWO-POLE PERMANENT MAGNET A.C. MACHINES.

4,385,502. DEFROST CONTROL DEVICE AND METHOD OF OPERATING SUCH.

Applications for license should be addressed to: Division Patent Counsel, Space Systems Division, General Electric Co., P.O. Box 8555, Philadelphia, Pa., 19101.

4,374,081. CURE OF EPOXY SYSTEMS AT REDUCED PRESSURES.

4,390,583. ALUMINA–ALUMINA COMPOSITE.

4,398,200. FEED APERTURES WITH CROSSPOLARIZATION COMPENSATION FOR LINEAR POLARIZATION.

4,399,547. RECEIVER OF PULSED PHASE MODULATED SIGNALS.

4,400,825. ADJUSTABLE SLIT RADIOGRAPHIC APPARATUS.

Applications for licenses should be addressed to: Technology Programs Patent Counsel, Power Systems Sector, General Electric Co., 1 River Rd., Bldg. #2, RM. 413, Schenectady, N.Y. 12345.

4,201,760. MOLTEN SALT SYNTHESIS OF LITHIUM BETA-ALUMINATE POWDER.

4,209,236. SOLAR CENTRAL RECEIVER HELIOSTAT REFLECTOR ASSEMBLY.

4,209,312. CONTROLLIG SIZE IN GLAUBER'S SALT CRYSTAL FORMATION.

4,209,573. SULFUR ELECTRODE CONTAINER AND METHODS OF MANUFACTURE.

4,212,287. INSOLATION INTEGRATOR.

4,219,653. PROCESS AND APPARATUS FOR SEPARATING PARTICULATE MATTER FROM GASEOUS MEDIA.

4,216,278. PROCESS OF MAKING ELECTRODE STRUCTURE FOR MOLTEN CARBONATE FUEL CELLS.

4,227,942. PHOTOVOLTAIC SEMICONDUCTOR DEVICES AND METHODS OF MAKING SAME.

4,242,426. ELECTROLYTE STRUCTURE WITH STRONTIUM TITANATE MATRIX FOR MOLTEN CARBONATE FUEL CELLS.

4,246,891. LOW REFLECTION LOSS CUSP LIKE REFLECTOR FOR SOLAR ENERGY COLLECTOR.

4,252,003. REDUCED POWER CONSUMPTION AIR CONDITIONING.

4,252,107. SOLAR TRACKING CONCENTRATOR.

4,252,543. PROCESS FOR QUENCHING AND CLEANING A FUEL GAS MIXTURE.

4,261,705. SYSTEM AND METHOD FOR HANDLING LOCK GAS IN A COAL GASIFIER SYSTEM.

4,267,879. METHOD FOR FORMING GLAUBER'S SALT CRYSTALS OF REDUCED SIZE BY INCLUDING A FLUORIDINE-CONTAINING SURFACTANT.

Examination

Pursuant to the provisions of 37 C.F.R. 1.341(c), an examination for persons seeking registration before the United States Patent and Trademark Office as patent attorneys and agents will be held on Tues., Apr. 10, 1984.

With the exception of those former patent examiners for whom the examination is waived, all persons recognized for practice before the Patent and Trademark Office in patent cases must pursuant to the noted rule, pass the examination. Those passing the examination do not thereby qualify for recognition for practice before the Patent and Trademark Office in trademark cases. Recognition for practice in trademark cases is governed by Rule 2.12 of the Trademark Rules of Practice, which does not require the passing of an examination.

37 C.F.R. 1.341(f) provides, in pertinent part, "Officers and employees of the United States who are disqualified by statute (18 U.S.C. 203, 205) from practicing as attorneys or agents in proceedings or other matters before Government departments or agencies, may not be registered, * * * but officers or employees whose official duties require the preparation and prosecution of applications for patent may be registered (on compliance with the regulations in this part) or recognized to practice, to the extent necessary to carry out their official duties." If you are an officer or employee of the United States who is not disqualified for registration under 37 C.F.R. 1.341(f) when you apply to take the examination, your application for registration *must* be accompanied by your supervisor's *verified statement* that your official duties as a United States officer or employee require that you prepare and prosecute applications for patent. After passing the examination, you will be considered eligible for registration. If you are disqualified for registration under 37 C.F.R. 1.341(f) when you apply, approval of your application to take the examination will be subject to the following conditions.

1. If you pass the examination, you will not be registered so long as you remain disqualified for registration under 37 C.F.R. 1.341(f). However, if within one (1) year from the date notification of passing is mailed, your status changes and you are no longer disqualified under 37 C.F.R. 1.341(f), you will be considered eligible for registration upon satisfactory proof of your change in status.
2. If you have not become registered within one (1) year from the date notification of passing is mailed, you may not become registered thereafere except upon taking and passing another regularly scheduled examination.

The examination will be given under the supervision of the Office of Personnel Management (formerly Civil Service Commission), and may be taken in any of the cities in which the Office of Personnel Management regularly conducts examinations. Applications to take the examination must be filed in the Patent and Trademark Office together with a $75 fee not later than Jan. 31, 1984.

Application blanks may be obtained from the Clerk, Office of Enrollment and Discipline, Bldg. 4, 11th Floor, Room E14, Crystal Plz., Arlington, Va. or by mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and directed to the attention of the Clerk, Office of Enrollment and Discipline.

WILLIAM FELDMAN,
Director, Office of
Enrollment and Discipline.

Patent Cooperation Treaty (PCT) Update

I. Accession to the Patent Cooperation Treaty (PCT) by Mauritania and Listing of PCT Member Countries.

The Patent and Trademark Office has received notification from the World Intellectual Property Organization (WIPO) that Mauritania deposited its instrument of accession to the PCT on January 13, 1983. Therefore, according to PCT Article 63(2), Mauritani may be designated in international applications filed on and after April 13, 1983.

Listing of PCT Member Countries

Country	Ratification or Accession	Date of Ratification or Accession	Date from which Country may be Designated
(1) Central African Republic*	Accession	15 September 1971	01 June 1978
(2) Senegal*	Ratification	08 March 1972	01 June 1978
(3) Madagascar	Ratification	27 March 1972	01 June 1978
(4) Malawi	Accession	16 May 1972	01 June 1978
(5) Cameroon*	Accession	15 March 1973	01 June 1978
(6) Chad*	Accession	12 February 1974	01 June 1978
(7) Togo*	Ratification	28 January 1975	01 June 1978
(8) Gabon*	Accession	06 March 1975	01 June 1978
(9) United States of America	Ratification	26 November 1975	01 June 1978
(10) Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11) Congo*	Accession	08 August 1977	01 June 1978
(12) Switzerland**	Ratification	14 September 1977	01 June 1978
(13) United Kingdom**	Ratification	24 October 1977	01 June 1978
(14) France**	Ratification	25 November 1977	01 June 1978
(15) Soviet Union	Ratification	29 December 1977	01 June 1978
(16) Brazil	Ratification	09 January 1978	01 June 1978
(17) Luxembourg**	Ratification	31 January 1978	01 June 1978
(18) Sweden**	Ratification	17 February 1978	01 June 1978
(19) Japan	Ratification	01 July 1978	01 October 1978
(20) Denmark	Ratification	01 September 1978	01 December 1978
(21) Austria**	Ratification	23 January 1979	23 April 1979
(22) Monaco	Ratification	22 March 1979	22 June 1979
(23) Netherlands**	Ratification	10 April 1979	10 July 1979
(24) Romania	Accession	23 April 1979	23 July 1979
(25) Norway	Ratification	01 October 1979	01 January 1980
(26) Liechtenstein**	Accession	19 December 1979	19 March 1980
(27) Australia	Accession	31 December 1979	31 March 1980
(28) Hungary	Ratification	27 March 1980	27 June 1980
(29) Democratic People's Republic of Korea (North Korea)	Accession	08 April 1980	08 July 1980
(30) Finland	Ratification	01 July 1980	01 October 1980
(31) Belgium**	Ratification	14 September 1981	14 December 1981
(32) Sri Lanka	Accession	26 November 1981	26 February 1982
(33) Mauritania*	Accession	13 January 1983	13 April 1983

*Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI member countries. A designation of any country is an indication that all OAPI countries have been designated. Note: Only one designation fee is due regardless of the number of OAPI member countries designated.

**Members of European Patent Convention (EPC) regional patent system. Either national patents or European patents for member countries are available through PCT, except for France and Belgium, for which only Europ.an patents are available if PCT is used. Note: Only one PCT designation fee is due if European regional patent protection is sought for one, several or all EPC member countries.

II. Change in International Fees Effective January 1, 1984

On October 4, 1983 the PCT Assembly in its tenth session (4th Ordinary) held in Geneva, Switzerland, fixed U.S. dollar amounts for the changed international fees that are set in Swiss francs in the Schedule of Fees annexed to the PCT Regulations.

Effective January 1, 1984, for U.S. applicants filing PCT international applications in the United States Receiving Office, the amounts of the international fees are:

Basic Fee (first 30 pages)	$295.00
Basic Supplemental Fee (each page over 30)	$6.00
Designation fee (per country or region)	$70.00

The Transmittal and Search Fees remain unchanged:

Transmittal Fee	$ 125.00
Search Fee	
For the U.S. Patent and Trademark Office as Searching Authority:	
No prior corresponding U.S. application	$500.00
Prior corresponding U.S. application	$250.00
Supplemental Search Fee for each additional invention	$125.00
For the European Patent Office (EPO) as Searching Authority	
Search Fee for each application	$670.00
Supplemental Search Fee for each additional invention	payable directly to the EPO.

A listing of current PCT fees appears in each issue of the *Official Gazette.*

Nov. 14, 1983.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 13, 1983

D. 257,360	4,371,303	4,390,772	4,403,285
D. 269,184	4,373,551	4,391,723	4,403,387
D. 269,185	4,374,871	4,391,859	4,403,760
D. 269,275	4,375,459	4,392,061	4,404,496
4,093,213	4,375,616	4,392,482	4,404,979
4,264,195	4,376,548	4,392,623	4,404,997
4,293,704	4,379,117	4,393,125	4,405,002
4,293,954	4,379,354	4,393,324	4,405,418
4,295,699	4,379,357	4,394,002	4,405,702
4,299,917	4,380,771	4,394,508	4,405,838
4,306,299	4,381,079	4,395,476	4,405,942
4,345,360	4,381,310	4,396,430	4,406,248
4,349,576	4,381,318	4,396,987	4,406,309
4,353,326	4,381,382	4,397,177	4,406,600
4,353,448	4,382,293	4,397,732	4,406,899
4,356,923	4,382,430	4,398,420	4,407,098
4,357,496	4,382,560	4,398,633	4,407,574
4,358,600	4,383,097	4,398,769	4,407,835
4,363,211	4,385,887	4,399,027	4,408,058
4,365,125	4,385,987	4,399,644	4,408,125
4,366,574	4,386,108	4,400,197	4,408,269
4,368,351	4,387,024	4,400,372	4,408,342
4,368,978	4,387,619	4,400,481	4,408,743
4,369,664	4,388,669	4,400,600	4,408,744
4,370,190	4,389,122	4,401,940	4,409,146
4,370,521	4,389,704	4,402,179	4,409,343
4,370,572	4,390,378	4,402,758	

Disclaimers

4,229,289.—*John G. Victor,* Darien, Ill. FLUIDIZED BED APPARATUS AND PROCESS. Patent dated Oct. 21, 1980. Disclaimer filed Oct. 27, 1983, by the assignee, *Institute of Gas Technology.*

Hereby enters this disclaimer to claims 6, 10 and 12 of said patent.

4,304,345.—*E. Michael Carlin,* Milpitas, Calif. MODULAR BIDIRECTIONAL TRACTOR FEED ASSEMBLY. Patent dated Dec. 8, 1981. Disclaimer filed Oct. 20, 1983, by the assignee, *Xerox Corp.*

Hereby enters this disclaimer to claims 1–10 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REEXAMINATIONS

DECEMBER 13, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,218,438 (150th)

ANTICOCCIDIAL COMBINATIONS COMPRISING NICARBAZIN AND THE POLYETHER ANTIBIOTICS

Maurice E. Callender, Indianapolis, and Thomas K. Jeffers, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Reexamination Request No. 90/000,258, Sep. 17, 1982.
Reexamination Certificate for Patent No. 4,218,438, issued Aug. 19, 1980, Ser. No. 12,165, Feb. 14, 1979.
Int. Cl.³ A61K *31/505, 31/34*
U.S. Cl. 424—251

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **15–17** and **31–33**, having been finally determined to be unpatentable, are cancelled.

Claims **1**, **2**, and **18** are determined to be patentable as amended:

Claims **3–14** and **19–30**, dependent on amended claims, are determined to be patentable.

New claims **34–41** are added and determined to be patentable.

1. A process for controlling coccidiosis in poultry which comprises orally administering to the poultry a feedstuff comprising a first component which is a polyether antibiotic *selected from the group consisting of monensin, laidlomycin, grisorixin, lenoremycin, salinomycin, narasin, lonomycin, alborixin, antibiotic 204A, etheromycin, lasalocid, isolasalocid A, lysocellin, and antibiotic A23187,* and a second component which is selected from the group consisting of nicarbazin and 4,4'-dinitrocarbanilide, said components being present in the feedstuff in amounts which, in combination, are synergistic as to at least one coccidiosis-causing strain of Eimeria.

B1 4,305,296 (148th)

ULTRASONIC IMAGING METHOD AND APPARATUS WITH ELECTRONIC BEAM FOCUSING AND SCANNING

Philip S. Green; Dilip G. Saraf, both of Atherton, and James F. Havlice, Los Altos, all of Calif., assignors to SRI International, Menlo Park, Calif.

Reexamination Request No. 90/000,350, Mar. 24, 1983.
Reexamination Certificate for Patent No. 4,305,296, issued Dec. 15, 1981, Ser. No. 119,937, Feb. 8, 1980.
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—626

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–28** is confirmed.

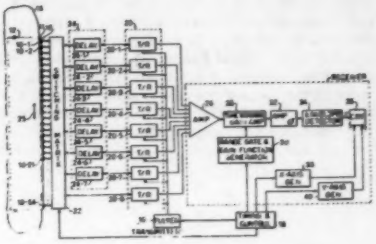
1. In pulsed ultrasonic imaging apparatus for imaging a section within an object, which apparatus includes a linear transducer array and pulse transmitter means for energizing transducer elements of the array for beaming ultrasonic energy pulses into the section,

beam focusing means for focusing of the transducer array at different range zones within the section to be imaged,

beam scanning means for scanning the section to be imaged,

range gated signal processing means responsive to the output from the transducer array for processing signals received from the range zone at which the beam is focused, and

means for control of said beam focusing and range gated signal processing means to provide line segment signals



from each of the range zones for use in visual display of the section to be imaged, a line segment signal for a single range zone being obtained with each operation of the pulse transmitter means.

B1 4,360,288 (149th)

FIBERGLASS SUCKER ROD CONSTRUCTION

Woodrow T. Rutledge, Jr.; Russell P. Rutledge; John E. Freeman, and Steven D. Clark, all of Big Spring, Tex., assignors to Fiberflex Products, Inc., Big Spring, Tex.

Reexamination Request No. 90/000,318, Jan. 20, 1983.
Reexamination Certificate for Patent No. 4,360,288, issued Nov. 23, 1982, Ser. No. 76,373, Sep. 17, 1979.
Int. Cl.³ F16B *11/00;* **F04B** *47/02*
U.S. Cl. 403—268

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **6–8**, having been finally determined to be unpatentable, are cancelled.

Claims **1–4** and **9** are determined to be patentable as amended:

Claims **5** and **10**, dependent on amended claims, are determined to be patentable.

New claims **11–16** are added and determined to be patentable.

1. A sucker rod construction for use in producing oil wells, said sucker rod construction comprising:

a [first] connector member *having an outer surface and* being formed to define a rod receptacle having a closed axially [outer] *inner* end and an open axially [inner] *outer* end, said rod receptacle having a plurality of integrally formed axially spaced apart outwardly converging tapered frusto-conical [annular] *internal* surfaces, [each of said surfaces having substantially the same taper] *said outer surface of said connector member and said internal surfaces defining between them a rod receptacle wall, said outer surface being substantially cylindrical laterally adjacent all said frusto-conical internal surfaces except the one most near said axially outer open end of said rod receptacle, the outside surface of the connector member laterally adjacent that one internal surface most near the said open end having a gradual axially convergent taper whereby the rod receptacle wall along said one internal surface is less thick at portions nearer said open end than at portions nearer and laterally adjacent the axially upper reach of said one internal surface*;

a cylindical fiberglass rod having an end having a uniformly cylindrical uninterrupted outer surface being received within said rod receptacle through said [inner] *outer* end and cooperating therewith to define an annular chamber between said outer surface of said end of said rod and said outwardly converging tapered frusto-conical surfaces;

and a body of initially liquid adhesive material filing said annular chamber that cures to bond to said outer surface of said end of said rod and to harden to form a plurality of shear and compression resistant frusto-conical wedges to cooperate with said frusto-conical surfaces.

REISSUES

DECEMBER 13, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

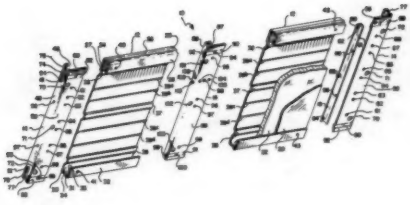
Re. 31,461
METHOD OF PREPARING A SECTION FOR AN OVERHEAD DOOR

David O. Martin, Salt Lake City, and Lawrence G. Martin, Bountiful, both of Utah, assignors to Martin Overhead Door and Electronics Co., Salt Lake City, Utah

Original No. 4,347,653, dated Sep. 7, 1982, Ser. No. 246,805, Mar. 23, 1981. Division of Ser. No. 59,880, Jul. 23, 1979, Pat. No. 4,284,119. Application for reissue Sep. 29, 1982, Ser. No. 426,751

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—526 R 7 Claims



6. A method of preparing a section for an overhead door system comprising:

forming a section facing for the section by shaping a generally rectangular sheet of metal with a hem and a longitudinal channel along each edge of the section facing;

fabricating end stiles for the section by forming a metal stock into end stiles having a front face, a side wall and a rear face, and hem-receiving grooves adjacent each end of the rear face, the front face overlapping the end of the section facing with the ends of the rear face fitting within the channels with the hem receiving grooves receiving the hems therein while the side wall encloses the end of the section;

preparing support means at the side wall inside the end stile for securing the end of the section facing to the end stile; and

assembling the section by mounting an end stile to each end of the section facing and securing the end of the section facing to the end stile with the support means.

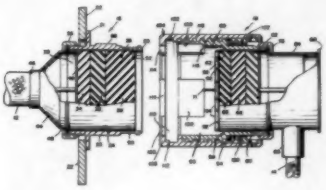
Re. 31,462
ELECTRICAL CONNECTOR

Larry L. McCormick, and Ben F. Selk, both of Los Angeles, Calif., assignors to Automation Industries, Inc., Greenwich, Conn.

Original No. 3,848,950, dated Nov. 19, 1974, Ser. No. 287,184, Sep. 7, 1972. Application for reissue May 13, 1981, Ser. No. 253,650

Int. Cl.³ H01R *13/629*

U.S. Cl. 339—90 R 33 Claims



5. An electrical connector including the combination of

a plug section,

a first set of electrical contacts in said section,

a receptacle section, said receptacle section being effective to mate with said plug section,

a second set of electrical contacts in said second section,

a *zero pitch* breech lock on said sections effective to releasably secure said sections together when they are mated, and

means operatively interconnected with said breech lock for moving one of said sets of contacts into and out of engagement with the other of said sets of contacts when said breech lock secures said sections together and releases them from each other.

Re. 31,463
RADIOPHARMACEUTICAL CHELATES AND METHOD OF EXTERNAL IMAGING

Michael D. Loberg, New Brunswick, N.J.; Patrick S. Callery, Luthersville, Md., and Malcolm Cooper, Chicago, Ill., assignors to Research Corporation, New York, N.Y.

Original No. 4,017,596, dated Apr. 12, 1977, Ser. No. 609,545, Sep. 2, 1975. Continuation-in-part of Ser. No. 555,037, Mar. 3, 1975, abandoned. Application for reissue May 8, 1980, Ser. No. 148,052

Int. Cl.³ A61K *43/00, 49/00;* C07C *101/20*

U.S. Cl. 424—1.1 24 Claims

1. A chelate of technetium-99m, cobalt-57, gallium-67, gallium-68, indium-111 or indium-113m and a substituted iminodiacetic acid [.]. *said chelate, upon intravenous administration, being liver and/or gallbladder selective.*

PLANT PATENTS

GRANTED DECEMBER 13, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,155

ROSE CV. AROCLIDD

Joseph L. Moon, Wasco, and Jack E. Christensen, Ontario, both of Calif., assignors to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jul. 1, 1982, Ser. No. 394,479
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—2 **1 Claim**

1. A new and distinct variety of rose as a sport of the rose cv. Double Delight (U.S. Plant Pat. No. 3,847) characterized in that it is a climber and flowers on second season's wood, with a large flowering flush in the spring followed by intermittent flowering during the remainder of the growing season and otherwise having the characteristics of the parent rose Double Delight.

5,156

ROSE PLANT CV. AROCHER

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jun. 22, 1982, Ser. No. 390,898
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, being particularly characterized in its flower coloration is initially essentially pink and turns to a deep blood red, its large flower size, its abundant production of flowers, and its wavy leaflet margins.

5,157

HYBRID GRANDIFLORA ROSE CV. SHREVEPORT

Reimer Kordes, Aspern Krs. Pinneberg, Fed. Rep. of Germany, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jun. 14, 1982, Ser. No. 388,028
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—17 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid Grandiflora class, substantially as herein shown and described being particularly characterized in its profusion of brightly colored, leathery foliage covering even the lowest branches; its upright habit and highly branched bush; its above average resistance to disease and its vigor.

5,158

BEGONIA PLANT NAMED ENCORE

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Sep. 15, 1982, Ser. No. 418,489
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia named Encore, as described and illustrated, and particularly characterized by its bright pink double flowers, dark green, firm to crisp glabrous foliage with serrated edges; excellent keeping qualities, and by its continuous year round flowering.

PATENTS

GRANTED DEC. 13, 1983

ERRATA

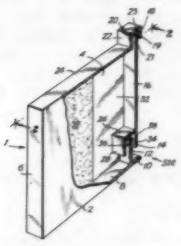
For CLASS	See PATENT NO.
135–120	4,420,017
206–315	4,420,024
502–180	4,420,415
502–168	4,420,416
502–169	4,420,417
502–077	4,420,418
502–068	4,420,419
502–261	4,420,420
502–316	4,420,421
381–094	4,420,655
381–015	4,420,658

PATENTS

GRANTED DECEMBER 13, 1983

GENERAL AND MECHANICAL

4,419,771
PASSIVE DISPENSER
Randall G. Richards, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio
Filed Feb. 8, 1982, Ser. No. 346,975
Int. Cl.³ E03D *9/02, 9/03*
U.S. Cl. 4—228 **8 Claims**



1. A non-siphoning passive dispenser for containing a quantity of a solution isolated from a body of liquid in which the dispenser is immersed and for causing a predetermined volume of said solution to issue from the dispenser solely under conditions of gravity flow in response to the level of said body of liquid being lowered from a first elevation to a second elevation, the dispenser comprising:

a product reservoir containing a solute into which said liquid flows to form said solution when the level of said body of liquid rises from said second elevation to said first elevation, said quantity of solution being stored therein;

venting means in fluid communication with said reservoir, and

a discharge/refill conduit disposed below said venting means, said conduit connecting the reservoir with the body of liquid and comprising two chambers in fluid communication with each other, one chamber being adjacent to said reservoir to form an air trap chamber and the other chamber being adjacent to said body of liquid to form an air refill chamber, said air trap chamber and said air refill chamber having wall segments of equal length such that said solution issues from the dispenser due to non-siphonic flow; a transfer port connecting said air trap and air refill chambers, the cross-sectional area of said transfer port normal to fluid flow being smaller than the cross-sectional area of said air trap chamber normal to fluid flow such that air in said conduit is not completely displaced by said liquid when the level of said body of liquid rises from the second elevation to the first elevation, the air being entrapped in said air trap chamber and forming, upon cessation of flow into said reservoir, an air lock in said conduit which substantially isolates said solution from said body of liquid.

4,419,772
WATER SAVER
Clark K. Smith, 1004 Wedgewood La., Durham, N.C. 27713
Filed Jan. 12, 1982, Ser. No. 338,884
Int. Cl.³ E30D *1/20*
U.S. Cl. 4—364 **20 Claims**

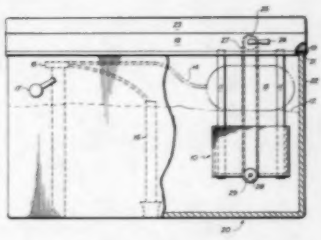
1. A device for saving water in toilet water closets and the like, comprising in combination:

a reservoir disposed within the closet oriented so that at least a portion of said reservoir is below an associated normal water level,

means for admitting water into said reservoir,

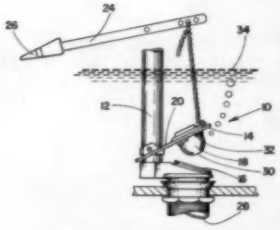
means for discharging water from said water closet,

means for cooperating with said reservoir to incrementally retain amounts of water in said reservoir varying from zero to the full capacity of said reservoir upon flushing water from the water closet,



means external of said water closet for incrementally positioning said means for cooperating whereby the amount of water used in flushing the toilet can be varied in accordance with demand.

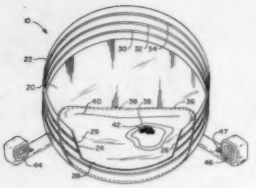
4,419,773
ADJUSTABLE TANK DISCHARGE VALVE FOR CONTROLLING FLUSH WATER VOLUME
Donald E. Sullivan, 1493 Fahlander Dr. S., Columbus, Ohio 43229
Filed Mar. 12, 1982, Ser. No. 357,731
Int. Cl.³ E03D *1/34*
U.S. Cl. 4—392 **15 Claims**



1. An improved adjustable discharge valve closure of the type providing a selective water volume flush for the tank of a water closet, said discharge valve closure including a sealing portion and a buoyancy chamber portion attached to a mounting arm member at one end of said member, the other end of said member being pivotally attached to said tank for pivotal movement of the valve closure into and out of sealing engagement with the discharge valve seat, said buoyancy chamber portion, in the closed operable position of the valve closure, including a relatively lower drain hole and a relatively higher bleeder port formed through a wall of the buoyancy chamber portion said bleeder port being connected with gas at atmospheric pressure when said closure is in its closed position;

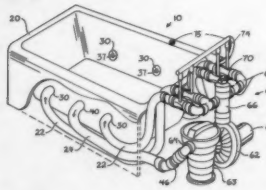
wherein the improvement permits manual adjustment of the water volume of a flush and comprises mounting at least the portion of the wall of the buoyancy chamber through which the bleeder port is formed for rotary movement about the center axis of the valve closure, which movement due to the pivotal movement of said mounting arm will vary the distance of said bleeder port from said tank bottom.

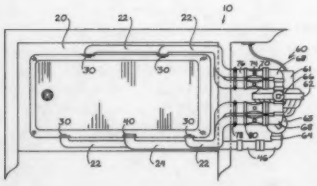
4,419,774
DISPOSABLE SHAMPOO BASIN
Rosemary T. Hajek, 615 Shamrock Rd., Bel Air, Md. 21014
Filed Dec. 20, 1982, Ser. No. 451,399
Int. Cl.³ A54D *19/08, 19/10*
U.S. Cl. 4—516 **12 Claims**



1. In a system for use in washing the hair of a patient on a bed and having a base, a wall around the base and means including a quantity of soft particulate matter for supportively sealing at a patient's head/neck/shoulder area, the improvement comprising: the means for supportively sealing including a part of said wall and a bag, and means in said bag for adjustably contouring said bag for water-tight fit to a patient's neck.

4,419,775
WHIRLPOOL BATH
Thomas P. Ebert, 1611 Sheffield Ct., Elgin, Ill. 60120
Filed Aug. 10, 1981, Ser. No. 291,818
Int. Cl.³ A61H *33/02;* **E03C** *1/02*
U.S. Cl. 4—542 **14 Claims**





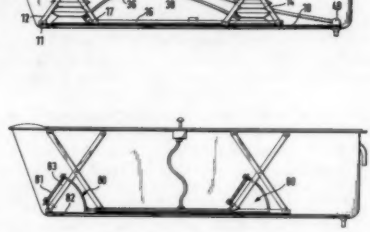
1. A whirlpool bath for installation in an in-place bathtub comprising said bathtub and a pump assembly, said pump assembly being connected to said bathtub through at least one flexible inlet pipe; said flexible inlet pipe serving to take water from said pump to said bathtub and to permit said installation in said in-place bathtub; and at least one flexible outlet pipe, said flexible outlet pipe serving to return water from said bathtub to said pump and said flexible inlet pipe and said flexible outlet pipe permitting said installation in said in-place bathtub; wherein:

(a) said inlet pipe is connected at one end to an inlet means within said bathtub for the purpose of providing whirlpool action in said bathtub, and said inlet pipe is connected at the other end to said pump;

(b) a water and air mixing means operatively situated between said pump and said inlet pipe, said water and air mixing means being connected to said pump and between said pump and said flexible inlet pipe—whereby said water and air mixing means combine with said flexible inlet pipe to provide whirlpool action; and

(c) a recirculating means for returning water from said bathtub to said pump.

4,419,776
BATHTUB ASSEMBLY FOR HANDICAPPED PERSONS
Peter Schmidt, D7989 Enkenhofen Gde.Argenbühl, Fed. Rep. of Germany
Filed May 27, 1982, Ser. No. 382,536
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1981, 3134516
Int. Cl.³ A47K *3/12*
U.S. Cl. 4—564 **6 Claims**



1. In a bathtub assembly for handicapped persons of the type having a bottom plate, a lifting plate, and a guide means intermediate the bottom plate and the lifting plate, the guide means being of the type having at least two scissors-like rocking lever sets, lift means which can be filled with water for lifting the lifting plate, and a manually-operated valve connectable with and responsive to a household water supply for controlling the lift means, the lift means having at least one collapsible hollow body closed at the ends, one end fastened at the bottom plate and the other end fastened to one of the lifting plate and the guide frame, the collapsible hollow body having a wall operable for folding with minimal stretch and which folds flat when the lifting plate is lowered, the hollow body having a water connection and being inflated by filling with water, the improvement wherein the guide means comprises pairs of identical guide frames connected to each end of the bottom plate and each end of the lifting plate, a longitudinal strut jointed to one end of each rocking lever of one guide frame of one pair of guide frames and to one longitudinally opposite end of a rocking lever of another guide frame of the opposite pair of guide frames, transverse axles jointed to transversely opposite ends of a rocking lever of each guide frame of each pair of identical guide frames, said struts and axles being mounted parallel to the bottom plate, and said struts and axles being operable to synchronously move the lifting plate parallel to itself; and wherein the hollow body comprises a hose having a diameter of about three inches, and means attached to the hose for

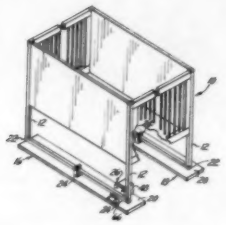
folding the hose into zigzag form when the lifting plate is lowered.

4,419,777

BABY BED ROCKING MECHANISM

Paraque Parker, Pontiac, Mich., assignor to Harold P. Parker, Pontiac, Mich.

Filed May 4, 1981, Ser. No. 260,277
Int. Cl.³ A97D 9/02
U.S. Cl. 5—108 6 Claims



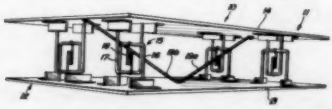
1. A mechanism for rocking a bed and the like, said mechanism comprising a pair of transverse rocker members secured to the legs of the bed, a base member supporting each of said transverse rocker members, pivot means between each of said transverse rocker members and each of said base members for pivotably supporting said transverse rocker members relative to said base members and power drive means for positively oscillating one of said transverse rocker members relative to a corresponding base member, said power drive means comprising a prime mover fastened to said base member by a first bracket, said prime mover having a rotatable output shaft passed through a journal bearing in a sidewall of said first bracket, said power drive means further comprising an eccentric member mounted on said output shaft of said prime mover, a stub shaft having an axis of rotation in alignment with the axis of rotation of said output shaft mounted on said eccentric member, said stub shaft being passed through a journal bearing in another sidewall of said first bracket, and a cam follower in the form of a second bracket mounted below said transverse rocker member, said second bracket having an elongated slot in at least one sidewall thereof, each of said elongated slots being provided with substantially parallel sides disposed substantially parallel to the longitudinal axis of said one of said rocker members and said parallel sides of each of said slots being further disposed at a distance from each other corresponding to the width of the eccentric member wherein said eccentric member is disposed between said parallel sides of each of said elongated slots of said second bracket and between said sidewalls of said first bracket.

4,419,778

FURNITURE SUSPENSION SYSTEM

Harold Griffith, R.R. #4, Springdale, Ark. 72764, assignor to Harold Griffith, Springdale, Ark.

Filed Aug. 10, 1981, Ser. No. 291,172
Int. Cl.³ A47C 23/08
U.S. Cl. 5—244 12 Claims



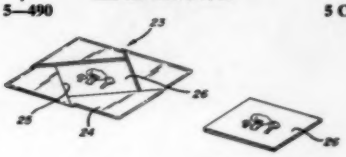
1. A suspension system for furniture comprising a base, a first generally U-shaped member, a second generally U-shaped member and a suspension spring, the first generally U-shaped member having the ends thereof fixedly attached to the base with the second generaly U-shaped member having the ends thereof fixedly attached to the furniture such that a portion of said first generally U-shaped member passes through the space bordered by said second generally U-shaped member and a portion of said second generally U-shaped member passes through the space bordered by said first generally U-shaped member and such that a portion of said first generally U-shaped member is directly above a portion of said second generally U-shaped member, said suspension spring having one end attached to the first generally U-shaped member proximate the portion thereof directly above said second generally U-shaped member and having the other end attached to the second generally U-shaped member proximate the portion thereof directly below said first generally U-shaped member.

4,419,779

PILLOW CONSTRUCTION AND METHOD

Larry Janesh, 3326 Lenox, Youngstown, Ohio 44502

Filed Apr. 8, 1982, Ser. No. 366,718
Int. Cl.³ A47G 9/00
U.S. Cl. 5—490 5 Claims



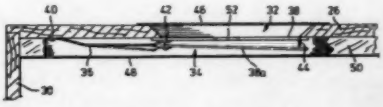
1. A pillow construction comprising a plurality of outwardly extending portions, each of a length equal to its width, each of said outwardly extending portions being joined along one longitudinal edge to a square center portion in an offset oppositely disposed relation to one another with the longitudinal edge of said outwardly extending portions of a length less than that of said square center portion and greater than that of one-half the length of said center portion, each of said outwardly extending portions being folded to define a triangle with its free edges parallel with and joined to said square center portion, a decorative insert placed within an area defined by said triangles.

4,419,780

HONEY DRYING VENTILATOR FOR BEEHIVES

Vladimir Shaparew, 3371 Trafalgar Rd., R.R. #1, Oakville, Ontario, Canada (L5J 4Z2)

Filed Jan. 27, 1981, Ser. No. 228,774
Claims priority, application Canada, Oct. 17, 1980, 362605
Int. Cl.³ A01K 47/06
U.S. Cl. 6—1 9 Claims



1. A honey drying ventilator for beehives, having substantially the same outer dimension as a honey super, and intended for installation above the top-most honey super, comprising:
a frame having front, back and side members;
an opening through one of said front, back or side members;
and a closure element capable of covering and uncovering at least a portion of said opening upon change of ambient air temperature said closure element having a first portion thereof which may change its physical positioning upon change of ambient air temperature, and a second rigid por-

tion thereof adapted to cover said opening; said closure element being arranged so that said rigid portion is swingably moved with respect to said opening to the extent that said opening is substantially fully covered by said rigid portion at any temperature below a predetermined temperature of the ambient air.

4,419,781

DIPSTICK WIPER APPARATUS

Dennis J. Meegan, 4 Meadowbrook Dr., Auburn, N.Y. 13021

Filed Apr. 22, 1982, Ser. No. 370,717
Int. Cl.³ G01F *15/12*
U.S. Cl. 15—210 B **7 Claims**

1. Dipstick wiper apparatus comprising a housing having a generally rectilinear portion and a foot portion, said rectilinear portion having a top, a bottom and a plurality of sides, said housing being open at the top and bottom thereof and said sides defining an opening extending longitudinally between the top and bottom thereof, one of said sides having an opening therethrough the other of said sides being closed, said foot portion being disposed at said bottom, a body of wiper material also generally rectilinear and having a top, a bottom and a plurality of sides, a slit extending longitudinally through said body between its top and bottom and laterally through one side thereof, said body being disposed in said longitudinal opening with said slit exposed through the open top and bottom of said rectilinear housing portion and through said opening in one side of said rectilinear housing portion for receiving said dipstick when inserted longitudinally into said slit and presenting said body for observation to said opening in said one side, said foot portion defining a generally "L" shape with said rectilinear body portion and having means for connection of said apparatus to a dipstick tube.

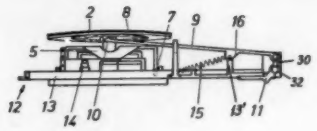
4,419,782

FILL-UP INDICATION ARRANGEMENT FOR A VACUUM CLEANER

Erhard Sobczyk, Schalksmuehle, and Paul-Ulrich Uibel, Ennepetal, both of Fed. Rep. of Germany, assignors to Vorwerk & Co Interholdung GmbH, Wuppertal, Fed. Rep. of Germany

Filed Oct. 22, 1981, Ser. No. 313,752
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1980, 3041005
Int. Cl.³ A47L *9/19*; G01L *7/08*
U.S. Cl. 15—339 **3 Claims**

1. A fill-up indication arrangement for a vacuum cleaner with an insertable filter bag, comprising a diaphragm mounted on a base in said cleaner communicating on one side thereof with the interior of the filter bag and with the exterior of the vacuum cleaner on the other side thereof and movable in upward and downward directions in response to the change in pressure differential between the interior of the filter bag and the exterior of the vacuum cleaner; a turnable indicator disc operatively connected to said diaphragm and adapted to move in response to the movement of said diaphragm; an angular gearing interconnected between said diaphragm and said disc to translate the movement of said diaphragm into the movement of said indicator disc, said angular gearing including a pivotable gear sector mounted on an axle on said base provided



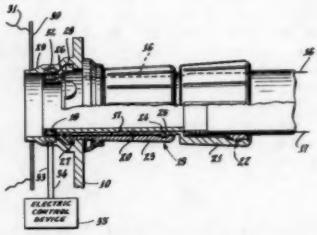
with teeth and cooperating with said diaphragm and a rod-like stop carried by said indicator disc, said teeth being inter engageable with said stop; said gear sector being adapted to pivot about said axle in response to movement of said diaphragm; said indicator disc being provided with a plurality of locking teeth positioned along a circular track in a spaced relationship with one another on the surface of said disc; and additional locking means including an elongated lever formed with a counter-locking tooth at one end thereof, said counter-locking tooth being engageable with said locking teeth.

4,419,783

REMOTE CONTROL FOR A VACUUM CLEANER MOTOR

Cennert O. Steffen, Taby, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed May 13, 1982, Ser. No. 377,691
Claims priority, application Sweden, Jun. 18, 1981, 8103840
Int. Cl.³ A47L *9/00*
U.S. Cl. 15—339 **6 Claims**

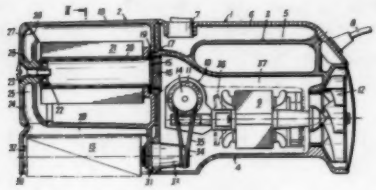


3. A remote control device for an electric motor of a vacuum cleaner having a hose including an operating handle connected to a suction nozzle, comprising: an electric control device for said motor mounted on said operating handle and being manually operable, electric conduits extending along said hose and being connected to said electric control device, a first coil connected to one of said conduits, said coil being arranged to surround the end of the hose which is connected to said vacuum cleaner, a second coil magnetically coupled to said first coil and connected to said electric control device, a tubular connecting part for said hose, a tubular flange on said vacuum cleaner for insertion of said connecting part, said first coil being arranged in said connecting part, and said second coil being arranged in said tubular flange.

4,419,784
PORTABLE BRUSH VACUUM CLEANER

Franz Lex, Annenstrasse 6, Graz, Austria

Filed Jun. 5, 1981, Ser. No. 271,091
Claims priority, application Austria, Jun. 10, 1980, 3040/80
Int. Cl.³ A47L 5/26
U.S. Cl. 15—344 9 Claims



1. A handheld vacuum for removing dust from an object comprising:

a casing;

an electric motor disposed within said casing;

suction means connected to said electric motor for removing said dust;

gear reduction means connected to said electric motor;

at least one cylindrical cleaning brush connected to and driven via said gear reduction means;

a dust collector provided on said casing;

fluid inlet means formed in said dust collector;

fluid outlet means formed in said dust collector communicating with said suction means;

at least one suction channel fluidly communicating with said fluid inlet means;

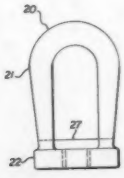
a brush housing separate from said dust container and disposed adjacent said at least one cylindrical cleaning brush and forming a suction chamber fluidly communicating with said at least one suction channel; and

baffle means operatively associated with said brush housing and longitudinally disposed adjacent an upper portion of said at least one cylindrical cleaning brush, said baffle means defining a surface portion of said suction chamber for preventing said dust from returning to said object.

4,419,785
BOLT EYELET WITH BOLT-ENGAGING SHOULDER FOR ELECTRICAL TRANSMISSION LINES

Carson H. McWhirter, Birmingham, Ala., assignor to Interpace Corporation, Whippany, N.J.

Filed Dec. 21, 1981, Ser. No. 332,951
Int. Cl.³ F16L 3/12
U.S. Cl. 16—1 R 3 Claims



1. A bolt eyelet in combination with a bolt having a stem, a head and a longitudinal axis comprising:

a U-shaped loop having an axis and loop ends;

a horseshoe shaped base disposed in a plane generally perpendicular to a central plane of said loop and integrally formed with said loop, said base having U-shaped aperture for receiving said stem of said bolt, said aperture having a semicircular end and being elongated in a transverse direction normal to the central plane of said loop, the length of said aperture being greater than a cross section of said bolt head, the loop ends being attached to said base at opposite ends of a diameter of the semicircular and of said aperture in the same plane as the central plane of the loop and wherein

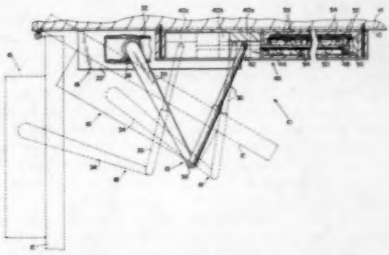
said base includes a shoulder, said shoulder and said loop being disposed on the same side of said base, said shoulder being positioned above and spanning across an end of said aperture located away from said ends of said loop to provide space for the entry of said bolt prior to a securing of said bolt to said eyelet;

whereby upon the placing of said bolt into position in the eyelet, the bolt head will be in the same plane as the shoulder and during a normal tightening of the bolt, the head will contact the shoulder to automatically align the bolt axis with the central plane of the loop and the loop axis and thereby facilitate the tightening and positioning of the bolt.

4,419,786
DOOR CLOSER ASSEMBLY

Walter E. Surko, Jr., Southington, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jan. 8, 1981, Ser. No. 223,398
Int. Cl.³ E05F 3/00, 15/04
U.S. Cl. 16—51 27 Claims



1. In a door closer assembly for connection between door and frame members relatively movable between open and closed positions, said closer assembly including a door closer having a control element supported for movement in one and an opposite direction, first biasing means for yieldably resisting movement of the control element in the one direction from one position to another position and for moving the control element from the other position to the one position, mounting means for attaching the door closer to one of the members, linking means connected to the door closer for movement with the control element, and connecting means for securing said linking means to the other of the members to move the control element in the one direction in response to movement of the door member in an opening direction relative to the frame member, the improvement wherein said connecting means comprises means for securing an operating portion of said linking means to the other of the members for movement along a predetermined path relative to the other member from one location to another location spaced a substantial linear distance from said one location in response to movement of the door in an opening direction beyond a predetermined position to an open position and retaining means for releasably retaining said connecting means at said other location while the door is in said open position and until the door returns to a closed position.

4,419,787

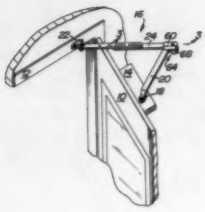
DOOR CLOSER ASSIST LINKAGE

Sidney Lieberman, Leola, Pa., assignor to Dorma Door Controls Inc., Reamstown, Pa.

Continuation of Ser. No. 166,334, Jul. 7, 1980, abandoned. This application Sep. 23, 1982, Ser. No. 422,000

Int. Cl.³ E05F 1/12

U.S. Cl. 16—65 **8 Claims**



1. A control linkage for use with a door closer and a door for transmitting force therebetween, the door closer being mounted on one of a door or a frame and the distal end of said control linkage being connected to a point of anchorage on the other of said door or frame, said control linkage having a door open limit position and comprising a first elongated arm connected to the output shaft of the door closer, a second elongated arm pivotably coupled to said first arm and having one end thereof pivotably coupled to said point of anchorage, and means interconnecting said arms to first resiliently bias said arms against relative rotation toward said door-open limit position as said arms approach said position and then limit said arms against movement beyond said position, said means interconnecting said arms comprising resilient biasing means coupled to one of said arms and adapted to come into force-transmitting engagement with the other of said arms only when said control linkage approaches said door open limit position, said resilient biasing means providing a force in opposition to movement of said arms toward said door-open limit position, and a dead stop member coupled to said other arm for engagement with said one of said arms when said control linkage is in said door-open limit position, said resilient biasing means being so configured and arranged as to provide a bias for said arms and the door away from the door-open limit position to aid the closer in closing the door, said resilient biasing means comprising a spring member anchored to said one of said arms, said spring member being a torsion spring having one end thereof fixedly coupled to said one of said arms, an abutment disposed on the other of said arms, and said spring member having a free end thereof which contacts said abutment only when said control linkage approaches said door open limit position, and hinge means pivotably interconnecting said arms, said hinge means comprising a pivot pin having one end thereof affixed to said one of said arms, said other of said arms being pivotably received on said pivot pin, and said one end of said spring member being non-rotatably affixed to said pivot pin.

4,419,788

ADJUSTABLE SPRING HINGE

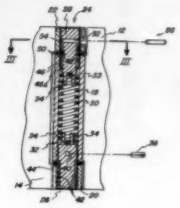
Addison S. Prout, Columbus, N.C., assignor to Bommer Industries, Inc., Landrum, S.C.

Filed Jun. 9, 1981, Ser. No. 271,995

Int. Cl.³ E05F 1/12

U.S. Cl. 16—300 **8 Claims**

1. A spring hinge comprising a pair of hinge leaves having hollow knuckles on adjacent edges located in end to end axial alignment to form a hollow hinge barrel, first and second pintles positioned in respective ends of the hinge barrel and extending into and between axially aligned knuckles of adjacent leaves to maintain them in axial alignment during their relative movement, means fixing said first pintle to a knuckle of one of said pair of said hinge leaves to prevent relative rotational movement therebetween, a torsion spring located in said hollow barrel and extending between said first and second pintles, said spring having each of its end portions operatively connected to a respective adjacent pintle to prevent relative rotation therebetween, a bushing carried on a reduced diameter portion of the peripheral surface of said second pintle and extending axially therealong to engage the inner surfaces of adjacent knuckles, said bushing having a circumferential groove on its outer surface, a resiliently deformable thrust washer positioned between the adjacent ends of said adjacent



knuckles in circumferentially surrounding relation to said bushing, said washer having an internal diameter which is less than the internal diameter of said barrel and the external diameter of the bushing adjacent its groove to reside in said bushing groove and thereby retain said second pintle in said barrel while permitting its rotational movement about the axis of the same, and means for adjustably rotatably positioning said second pintle and fixing it against rotation in one direction relative to a knuckle of the other of said pair of hinge leaves whereby the torsional force exerted by said spring between said pair of hinge leaves may be adjusted.

4,419,789

TORSION HINGE

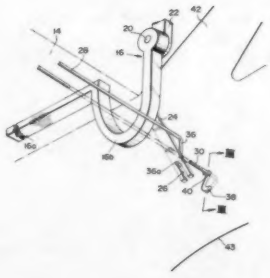
Tatsuhiko Matsui, Tokyo; Yasumasa Okada, Hino, and Minoru Shimatsu, Koganei, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 6, 1980, Ser. No. 194,529

Claims priority, application Japan, Oct. 9, 1979, 54-140870[U]

Int. Cl.³ E05F 1/12

U.S. Cl. 16—308 **6 Claims**



1. An opening mechanism for use with a vehicle trunk having a pivotally opening trunk lid, comprising:

(a) a relatively thin inner panel in the vehicle trunk having an S-shaped torsion bar mounting hole formed entirely therethrough;

(b) a torsion bar having a bent first end portion inserted into said mounting hole wherein a bar portion adjacent one side of the bar bend is constrained against rotation by

abutment against a first recess end of said mounting hole and a bar portion adjacent the other side of said bar bend is also constrained against rotation by abutment against a second recess end of said mounting hole, said torsion bar extending substantially parallel to the trunk lid and having a second end portion; and

(c) mounting means associated with the trunk lid for engaging said torsion bar second end portion and constraining said second end portion against rotation relative to said mounting means, said torsion bar being twisted about its axis when the trunk lid is closed causing said torsion bar to generate a torsional force urging the trunk lid to open.

4,419,790

FILLING TUBE FOR FILLING TUBULAR CASINGS WITH PASTY MATERIAL

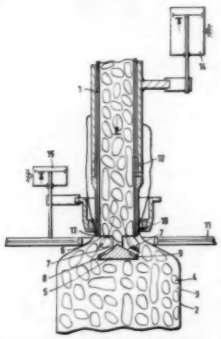
Herbert Niedecker, Am Ellerhang 8, D 6140 Königstein 2, Fed. Rep. of Germany

Continuation of Ser. No. 213,784, Dec. 8, 1980, abandoned. This application Aug. 3, 1982, Ser. No. 404,803

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1979, 2950590

Int. Cl.³ A22C *11/04*

U.S. Cl. 17—35 **2 Claims**



1. A filling apparatus for filling tubular casings with pasty material, comprising a hollow filling tube provided with a discharge opening, a cover or lidlike closure member mounted in front of the discharge opening of the filling tube, means for moving the closure member between a first position in which it closes the filling tube discharge opening and a second open position in which it permits discharge of the material to be packaged, web means for connecting the closure member to the filling tube peripherally in such a manner that the material to be packaged is radially deflected into the casing between the discharge end and the closure member, a shell tube surrounding the filling tube and having its forward edge formed as a knife edge, a snubber about the shell tube for snubbing a casing during filling, means for axially displacing the shell tube relative to the filling tube in the filling direction so that in arriving in its final position the shell tube knife edge cuts any material projecting radially beyond the filling tube and the shell tube constitutes a peripherally extending closure for the discharge openings of the filling tube, and means for closing the casing after the shell tube arrives in its final position.

4,419,791

METHOD OF UNROLLING AND PIECING A LAP

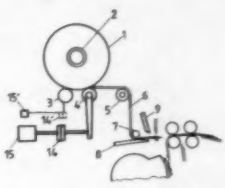
Hugo Schär, Neftenbach, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Continuation of Ser. No. 928,894, Jul. 28, 1978, abandoned. This application Dec. 6, 1982, Ser. No. 447,312

Claims priority, application Switzerland, Aug. 24, 1977, 10361/77

Int. Cl.³ D01G *19/08*

U.S. Cl. 19—215 **3 Claims**



1. A method of unrolling and piecing a lap for combing machines, lap drafters and the like, comprising the steps of:

supporting the lap on a pair of rolls, at least one of said rolls being connected to a drive which can be selectively engaged and disengaged;

disengaging said drive to said one roll to render said roll freely rotatable whereby a fiber layer of the lap can be easily unrolled therefrom;

piecing the fiber layer of said lap to a fiber layer of another lap; and

thereafter engaging said drive to said roll, whereby the lap is thus driven and the fiber layer is therefore unrolled from said lap without being drafted.

4,419,792

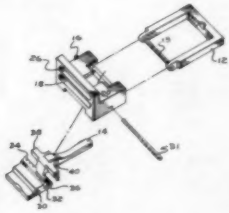
REVERSIBLE BELT AND BUCKLE MECHANISM

Jerry L. Kohli, Feeding Hills, Mass., assignor to Buxton, Inc., Agawam, Mass.

Filed Dec. 18, 1981, Ser. No. 332,012

Int. Cl.³ A44B *11/00*

U.S. Cl. 24—170 **8 Claims**



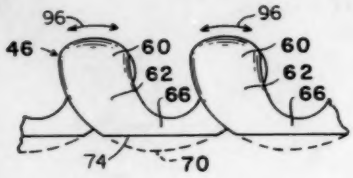
7. Reversible belt buckle for use with a separable belt comprising a belt receiving keeper, a discrete frame including a transverse pivot pin for hingedly coupling the frame to said keeper, and a latch lever pivotably mounted on said keeper, said lever being pivotable between a fully open position extending outwardly of said keeper and a closed position parallel to the undersurface of said keeper, said lever including a belt engaging rib extending from its upper surface and a downwardly facing channel for receiving the pivot pin of the frame and coupling the same to said keeper, said lever being pivotable about an axis and including a belthole engaging tongue pivotably carried by said lever whereby the lever is movable to engage simultaneously the underside of said belt by the belt engaging rib and to couple the frame to said keeper and to position said tongue in pivotable relation across said frame.

4,419,793

CONTINUOUS FILAMENT SLIDE FASTENER WITH CUTAWAY HEELS

George B. Moertel, Conneautville, Pa., assignor to Talon, Inc., Meadville, Pa.

Filed Oct. 16, 1981, Ser. No. 311,818
Int. Cl.³ A44B 19/12
U.S. Cl. 24—413 34 Claims



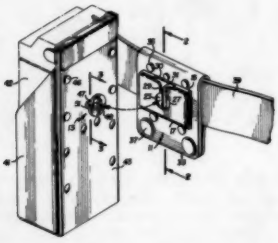
1. A stringer for a slide fastener comprising a support tape;
a filamentary member mounted on the support tape and including a continuous filament formed into successive convolutions defining coupling elements wherein each coupling element has a head portion, a pair of leg portions extending from opposite sides of the head portion, and a heel portion connecting one of the leg portions to a corresponding leg portion of an adjacent coupling element;
each coupling element being attached to said support tape;
said filament in the leg portion having a substantially uniform cross-sectional area; and
said filament in the heel portions having cross-sectional areas along the longitudinal length of said filament which are substantially reduced in size relative to the cross-sectional area of the leg portions by having a portion of the filament removed therefrom whereby flexibility of the stringer of the slide fastener is increased and the weight decreased.

4,419,794

PORTABLE FASTENING DEVICE

Harold O. Horton, Jr., and William B. Thompson, both of Orlando, Fla., assignors to Repco Incorporated, Orlando, Fla.

Filed Oct. 5, 1981, Ser. No. 308,883
Int. Cl.³ A44B 21/00
U.S. Cl. 24—667 4 Claims



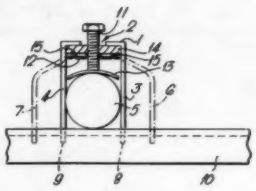
4. A device for removably and pivotally fastening two devices together comprising
a female section including a keyhole;
spring biasing means within said female section;
a ridge supported by said spring biasing means;
an open channel in said female section contiguous with the narrow dimension of said keyhole;
means for mounting said female section to one of said devices;
a male section comprising:
a button larger than said keyhole but having a width less than said open channel;
a flat stud connecting said button to the other one of said two devices, the narrow dimension of said stud having a width less than the narrow dimension of said keyhole;
an indentation in the outer face of said button having a geometrical configuration so as to mate with said ridge on said spring means;
whereby said button and said stud may be positioned such that said stud passes through said narrow dimension of said keyhole with said spring means exerting a biasing force against the face of said button; said button and said stud being rotatable against the force of said spring means so as to engage and disengage said ridge and said indentation.

4,419,795

CLAMPS FOR CABLES, PIPES AND THE LIKE

Robert C. Lyon, Wigan, England, assignor to BICC Limited, London, England

Filed Aug. 17, 1981, Ser. No. 293,108
Claims priority, application United Kingdom, Aug. 27, 1980, 8027683
Int. Cl.³ A44B 21/00
U.S. Cl. 24—530 6 Claims



1. A clamp for securing at least one cable (as hereinbefore defined) to a support comprises a channel member having an apertured base and limbs shaped at their free ends for engagement with the support, and a sub-assembly comprising a screw, a saddle captive on the end of the screw remote from the screw head and positioned inside the channel member, a nut threaded on the shank of the screw between the screw head and the saddle, the aperture in the base of the channel being large enough to permit passage of the head of the screw but not so large as to permit passage of the nut and the nut comprising a slightly flexible, sheet-metal member having a threaded aperture and spaced from the aperture on at least one face of the nut, at least one upstanding bearing surface comprising a minor part of the surface area of said face, which can bear on the base of the channel.

4,419,796

METHOD OF MAKING SPIN STABILIZED DISCARDING SABOT PROJECTILE

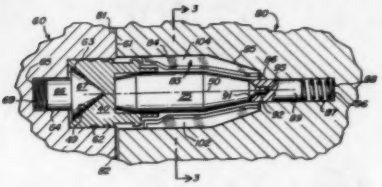
David E. Broden, Minnetonka, and Wilford E. Martwick, New Hope, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 24, 1981, Ser. No. 305,078
Int. Cl.³ B21K 21/06
U.S. Cl. 29—1.23 18 Claims

1. The method of producing a low dispersion discarding sabot projectile comprising the steps of:
(a) preassembling a subcalibre cylindrical projectile and a full calibre cylindrical pusher so that a tapered rear portion of said subcalibre projectile is set into a cup-like central forward facing recess in said pusher, said pusher comprising in part a circumferential groove positioned in approximate radial register with said tapered rear portion of said projectile;

(b) placing said preassembled subcalibre projectile and pusher into a two-section injection molding machine with a first section of said molding machine including recessed means for receiving and positioning the rear portion of said pusher and with a second section of said molding machine having spring biased recessed means for receiving and positioning a pointed forward tip portion of said subcalibre projectile;

(c) positioning said two-section molding machine so that said first and second sections (i) are in abutting relationship, and (ii) define a discarding sabot cavity concentrically about said subcalibre projectile and a rotation ring cavity concentrically about said circumferential groove;



(d) injection of plastic material into said cavities which material, upon hardening, forms a discarding sabot and a rotation ring;

(e) removing, as by machining, surplus hardened plastic material from the external surfaces of said discarding sabot and said rotating ring, said machining being done with respect to a reference axis passing through said pointed forward tip portion of said subcalibre projectile and the center of said pusher; and

(f) installing a preformed nose piece on said pointed forward tip portion of said subcalibre projectile.

4,419,797

MACHINING CENTER

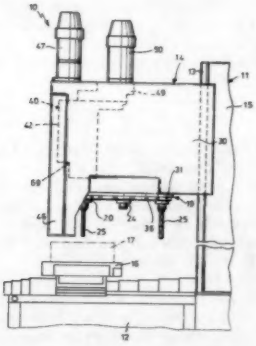
K. Eugen Sigloch, Nachsommerweg 33, D-7000 Stuttgart-Freiberg, and Gerhard Stark, Beethovenstrasse 21, D-7311 Notzingen, both of Fed. Rep. of Germany

Filed Nov. 13, 1980, Ser. No. 206,642

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1979, 2945770

Int. Cl.³ B23B *39/20*; B23Q *3/157*

U.S. Cl. 29—26 A **38 Claims**



1. A machining center for carrying out at least one of a drilling and milling operation, the machining center including a machine frame, an outrigger attached to the machine frame, a tool spindle means for rotatably driving a tool means, a tool carrier means for carrying the tool means, a tool magazine means for accommodating at least one tool carrier means, and means for mounting the tool spindle means to the outrigger so as to enable the tool spindle means to be displaced in an axial direction from an end position in alignment with a tool carrier means in the tool magazine means to a first position for enabling a coupling of the tool spindle means to the tool carrier means, and to at least one further position for machining a workpiece, and a magazine connecting means for supporting the tool carrier means during a coupling of the tool spindle means and for permitting an entrainment of the tool carrier means by the tool spindle means, characterized in that the mounting means includes a slide means arranged at the outrigger for enabling axial displacement of the tool spindle means, the tool spindle means extending through at least a zone of the slide means, means are provided for rotatably mounting the tool spindle means at the slide means, a guide means extends in parallel to an axis of rotation of the tool spindle means for guiding the slide means along a straight guide path, the guide means is arranged at a spacing from a portion of the machine frame to which the outrigger is attached, and includes at least one substantially planar slide track fixedly mounted on the outrigger, the tool magazine includes a gap for accommodating the tool carrier means to be supported by the magazine connecting means to be coupled with the tool spindle means and for enabling the zone of the slide means to pass through the tool magazine means, the slide means is arranged in a vicinity of a free end face of the outrigger, the free end face of the outrigger is disposed in a position facing away from the portion of the machine frame to which the outrigger is attached, and in that the zone of the slide means through which the tool spindle means extends faces the portion of the machine frame to which the outrigger is attached.

4,419,798

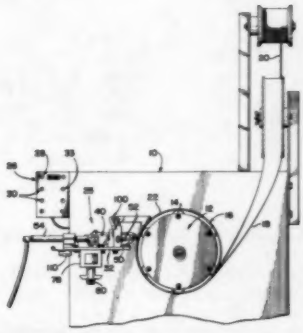
AUTOMATIC FLEXIBLE TUBE CUTTER

Wayne K. Fairchild, 3620 W. Pendleton Ave., Santa Ana, Calif. 92704

Filed Mar. 20, 1981, Ser. No. 245,744

Int. Cl.³ B23P *23/00*; B26D *1/22*

U.S. Cl. 29—33 T **3 Claims**



1. An automatic-cutting apparatus for selectively cutting a given length of wire-reinforced flexible tubing, comprising:

means for continuously forming a wire-reinforced flexible tubing;

a base member adapted to be secured to a fixed structure adjacent said flexible tubing, as said tubing is being continuously formed;

tube-cutting means operably mounted to said base member for selective cutting engagement with the annular wall of said tubing;

wire-cutting means operably mounted to said base member and adapted to cut the reinforcing wire of said tubing at a selected point, whereby said selected given length of said

tubing is separated from the tubing being continuously formed;

means attached to said tube-cutting and said wire-cutting means for operating both of said means;

means for selectively controlling the predetermined length of tubing to be cut in a continuous manner;

a carriage member slidably and pivotally attached to said base member;

wherein said operating means comprises:

a first actuating means pivotally mounted to said base member and connected to said carriage member to slidably engage said cutting means with the annular wall of said tubing for establishing an annular cut in said wall;

a second actuating means mounted to said base member and adapted to pivotally move said carriage member, whereby said wire-cutting means engages and cuts said reinforcing wire of said tubing;

cam means adapted to be engaged by said wire-cutting means to cause said wire-cutting means to cut said reinforcing wire;

said tube-cutting means including a cutting blade mounted to said carriage; and

said wire-cutting means comprising a pair of opposed wire-cutting members pivotally attached to each other, one of said wire-cutting members being affixed to said carriage, and the other wire-cutting member being positioned to freely engage said cam means, in order to close said opposed wire-cutting members as said carriage member is actuated by said second actuating means.

4,419,799

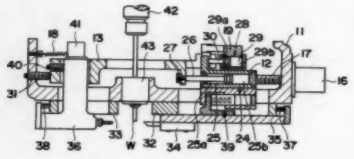
CUTTING TOOL DRIVING APPARATUS FOR A LATHE

Yoshifumi Tuchiya, 6 of 1373, Baigo 6, Ohme-Shi, Tokyo, Japan

Filed Jan. 27, 1982, Ser. No. 343,381

Int. Cl.³ B23B *21/00*

U.S. Cl. 29—37 A **3 Claims**



1. A radial cutting tool driving apparatus for a lathe, which comprises:

first and second sliders disposed opposite to each other, and supported slidably on a frame, work being positioned between said first and second sliders;

a servo motor and a ball screw and nut assembly adapted to drive said first slider;

a first piston and cylinder assembly provided in said first slider, and having a piston secured at one end to said second slider;

an arm supported rotatably on said frame;

a second piston and cylinder assembly provided intermediate the ends of said arm, and including a piston having one end engaging said first slider and a cylinder mounted on said arm;

a cam follower attached to one of said ends of said arm, and engaging said second slider; and

spring means urging said second slider away from said first slider.

4,419,800

METHOD OF FORMING A CAGE FOR FRUSTO-CONICAL ROLLER BEARINGS

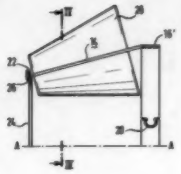
Otto Bihler, and Reiner Augenstein, both of Halblech, Fed. Rep. of Germany, assignors to Otto Bihler Maschinenfabrik GmbH & Co. K.G., Halblech, Fed. Rep. of Germany

Filed Jan. 21, 1981, Ser. No. 227,137

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1980, 3002688

Int. Cl.³ B21D *53/12*

U.S. Cl. 29—148.4 C **15 Claims**



1. Method of producing a cage for frusto-conical roller bearings comprising punching out windows from an elongated flat material first strip so that bars extending transversely of the elongated direction of the first strip remain between the windows, deforming the transversely extending bars, and bending the punched out strip to form a ring around the axis extending transversely of the elongated direction of the first strip and parallel to the flat surface of the first strip, wherein the improvement comprises punching out the flat material first strip so that a first bar extends along one elongated edge of the first strip with a number of elongated second bars extending transversely of the first bar and disposed in spaced relation in the elongated direction of the first strip and with the ends of the second bars spaced outwardly from the first bar being free so that the first bar and a pair of adjacent second bars form three sides of a window with the fourth side being open, deforming the second bars out of the plane of the first bar with the free ends of the second bars being offset relative to the plane of the first bar in the radial direction of the ring to be formed from the punched first strip whereby during the bending of the punched first strip and forming the first bar in the shape of a ring the free ends of the second bars are located on a circle having a diameter different from the diameter of the ring formed by the first bar, forming another end ring for connection to the free ends of the second bars, connecting the another end ring to the free ends of the second bars, and forming the another end ring from a flat material second strip by bending the second strip around an axis arranged to align with the bending axis of the first strip so that the flat surface of the second strip extends transversely of the bending axis of the second strip.

4,419,801

METHOD FOR MANUFACTURING A CAST IRON CYLINDER BLOCK

Hajime Yamashita, and Michio Takenaka, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jan. 19, 1981, Ser. No. 226,099

Claims priority, application Japan, Jan. 19, 1980, 55-4689

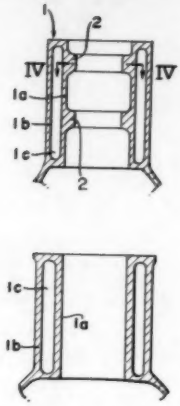
Int. Cl.³ B23P *15/00, 13/02*

U.S. Cl. 29—156.4 WL **4 Claims**

1. Method for manufacturing a cast iron cylinder block for an internal combustion engine, in which piston slap noise can be decreased, said method comprising the steps of:

casting an iron cylinder block with a cylinder wall formed with at least one protuberance in a first area that will be subjected to a peak piston side thrust force during a descending stroke of the piston and without a protuberance in a second area that is not subjected to a peak piston side thrust force during a descending stroke of the piston so that the cylinder wall possesses in said first area a struc-

ture of graphite phase which is at least one of A and C types in accordance with ASTM standard, said A type having substantially uniformly distributed graphite flakes of medium size and said C type having in mixture substantially uniformly distributed graphite flakes of large and



small sizes, having more advanced growth of graphite in said first area than in said second area, and

removing the protuberance to form a cylinder bore so that said first and second areas are provided with different graphite phases in the cast iron cylinder bore.

4,419,802

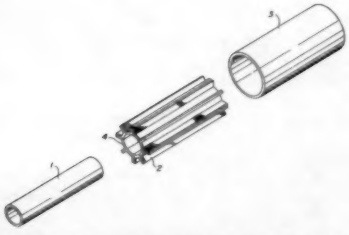
METHOD OF FORMING A HEAT EXCHANGER TUBE

W. A. Riese, 23 - 13th St. SW., Massillon, Ohio 44646

Filed Sep. 11, 1980, Ser. No. 186,155

Int. Cl.³ B23P *15/26*

U.S. Cl. 29—157.3 A **3 Claims**



1. A method of joining inner and outer tubes with fin means therebetween thus forming a heat exchange tube comprising the steps of:

sliding a first tube within a second tube,

inserting fin means therebetween,

expanding the first tube uniformly along its entire length radially for frictional engagement with the fin means which then causes the fin means ultimately to engage the second tube by expanding thereto, and not allowing the second tube to contract providing thereby a structure of uniform cross section along its entire length and assuring frictional contact of the tubes and fin means along the entire length wherein the first tube is expanded along its entire axial length by inserting a roller type tube expander therein and expanding the first tube radially outwardly with the roller expander along the entire axial length of the first tube.

4,419,803

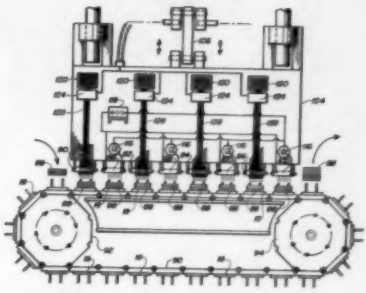
METHOD OF FORMING A TOOL ASSEMBLY

Henry M. Thornton, and John S. Thornton, both of York, Pa., assignors to Ashcombe Products Company, Dover, Pa.

Division of Ser. No. 231,340, Feb. 4, 1981. This application Nov. 26, 1982, Ser. No. 444,671

Int. Cl.³ B23P *11/00*; **B23B** *35/00*

U.S. Cl. 29—428 **6 Claims**



1. A method of drilling or cutting a predetermined pattern of holes or cuts in a product sheet of material comprising the steps of:

(a) selecting from a diagram sheet of an entire pattern of holes to be drilled in said product sheet of material desired partial patterns of holes of said entire pattern of holes to be drilled therein,

(b) digitizing said partial pattern of holes upon a tape for a numerically controlled drilling machine,

(c) operating a numerically controlled drilling machine as controlled by said digitized tape to drill said partial pattern of holes of predetermined diameter in a rigid sheet of material to form a rigid support plate having said partial pattern of holes for supporting respectively therein powered tool heads,

(d) successively forming additional complementary digitized partial patterns of holes in related and complementary tape recordals,

(e) successively forming related and complementary partial patterns of holes in additional rigid support plates to provide a set of said plates collectively embracing all holes to be drilled in said rigid support plates,

(f) mounting powered tool heads respectively in the holes in said set of rigid support plates to form gang tool assemblies, and

(g) drilling using said set of gang tools said partial patterns of holes successively in one or a stack of limited number of product sheets of material to achieve the entire desired pattern of holes therein.

4,419,804

METHOD FOR MANUFACTURING A PISTON ROD UNIT

Ludwig Axthammer, Hambach, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Hambach, Fed. Rep. of Germany

Filed May 29, 1981, Ser. No. 268,331

Claims priority, application Fed. Rep. of Germany, May 31, 1980, 3020749

Int. Cl.³ B23P *15/00, 11/00*

U.S. Cl. 29—434 **29 Claims**

1. A method of manufacturing a piston rod unit, including a metallic tube-shaped piston rod member having an initial inner diameter (d_i) and an initial outer diameter (d_o) and defining a cavity therein, and at least one terminal member (**4**) having a fastening pin (**4***a*) within a respective end portion of said cavity, said method comprising the following steps:

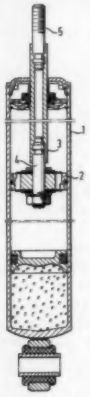
(a) providing a steel-made, tube-shaped piston rod member (3) with a constant initial inner diameter (d_i) and constant initial outer diameter (d_o) over the total axial length thereof;

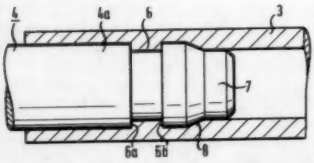
(b) providing a steel-made, terminal member (4) with the fastening pin (4*a*) to be introduced into said cavity, said fastening pin (4*a*) having

(b1) an inner, substantially cylindrical end portion (7);

(b2) an inner end face (7*a*) at the inner end of said inner end portion (7);

(b3) an annular axially extending frusto-conically shaped expanding face (8) having a first end with a smaller diameter (d_s) adjacent said inner end portion (7) and substantially corresponding to said initial inner diameter (d_i) of said tube-shaped piston rod member (3), and a second end with a larger diameter (d_1) adjacent the axial end of said expanding face (8) remote from said inner end face (7*a*), said larger diameter (d_1) being larger than said initial inner diameter (d_i) of said tube-shaped piston rod member;





(b4) at least one shoulder face (6*b*) directed away from said inner end face (7*a*) and being located on the side of said expanding face (8) which is remote from said inner end face (7*a*);

(c) introducing said inner end portion (7) into said cavity;

(d) urging said fastening pin (4*a*) into said cavity so as to expand said tube-shaped piston rod member (3) along an axial end portion (3*a*) thereof by said expanding face (8), the outer diameter of said tube-shaped piston rod member (3) being expanded to an expanded diameter (d_{ex}) along said end portion (3*a*), said expanded diameter (d_{ex}) being larger than the initial outer diameter (d_o) of said tube-shaped piston rod member and the expanded inner diameter of said piston rod member corresponding to both the larger diameter second end and the annular axially extending frusto-conically shaped expanding face of said expanding face;

(e) radially compressing said expanded end portion (3*a*) of said tube-shaped piston rod member (3) by cold shaping so as to reduce said expanded diameter (d_{ex}) substantially to said constant initial outer diameter (d_o) and to obtain axial engagement of said steel of said tubular piston rod member (3) with said shoulder face (6*b*).

4,419,805

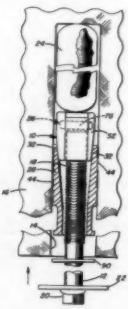
METHOD FOR COMBINING RESIN BONDING AND MECHANICAL ANCHORING OF A BOLT IN A ROCK FORMATION

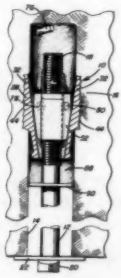
Frank Calandra, Jr., Johnstown, Pa., assignor to Jennmar Corporation, Cresson, Pa.

Filed Nov. 21, 1980, Ser. No. 209,134

Int. Cl.³ B23P *25/00*

U.S. Cl. 29—458 **8 Claims**





1. A method of anchoring a bolt in a bore hole comprising the steps of:

threadedly engaging a camming plug to the end of the bolt for axial movement thereon,

positioning an expandable shell having a plurality of longitudinally extending fingers in surrounding relation with the camming plug on the bolt,

preventing axial movement of the camming plug on the bolt by a stop means associated with the bolt upon rotation of the bolt in a preselected rotational direction,

preventing relative rotation between the bolt and the camming plug upon application of a predetermined torque by rotation of said bolt in the same preselected rotational direction so that the camming plug and the bolt rotate as a single unit and preventing said camming plug from rotating relative to said bolt and expanding said expandable shell,

displacing the stop means by the bolt as the bolt continues to rotate in said preselected rotational direction when a torque in excess of said predetermined torque is applied to the bolt; and

thereafter moving the camming plug on the bolt by rotation of said bolt in the same predetermined direction upon displacement of the stop means to expand the fingers of said expandable shell to anchor said expandable shell and said bolt connected thereto in the bore hole and applying a tension to said bolt.

4,419,806
TOOL CHANGING DEVICE ON MACHINE TOOLS, PARTICULARLY ON HORIZONTAL BORING AND MILLING MACHINES

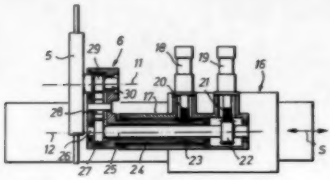
Karl-Josef Esser, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Scharmann GmbH & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Dec. 16, 1980, Ser. No. 214,632

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1979, 2950577

Int. Cl.³ B23Q 3/157

U.S. Cl. 29—568 **7 Claims**



1. A tool changing device for use with machine tools such as horizontal boring and milling machines having a headstock and drilling spindle, wherein the device exchanges tools between a tool supply and the drilling spindle, the device comprising in combination:

a base;

a carriage mounted on the base for reciprocation in the axial direction of the head stock and drilling spindle;

a pivot arm having a hollow mounting sleeve and a lateral portion, the hollow mounting sleeve being secured to said carriage for rotation only with respect thereto and having gear teeth therearound;

a first hydraulic cylinder mounted on the carriage and having a first toothed rack always only meshed with the gear teeth on the hollow mounting sleeve for rotating the pivot arm;

a shaft extending through the hollow mounting sleeve and having gear teeth at both ends thereof, the shaft being secured in the hollow mounting sleeve for rotation only with respect thereto;

a second hydraulic cylinder mounted on the carriage and having a second toothed rack always only meshed with the gear teeth on one end of the shaft for rotating the shaft;

a pinion journaled in the lateral portion of the pivot arm and meshing with the gear teeth at the other end of the shaft;

a gear journaled on the lateral portion of the pivot arm and meshed with the pinion, the gear having a mounting shaft projecting from the lateral portion of the pivot arm;

a tool changing arm having two ends with tool grasping members thereon, the tool changing arm being mounted midway its ends on the mounting shaft for rotation by the mounting shaft in a direction opposite that of the pivot arm as the pivot arm rotates; whereby the device inserts and withdraws tools as the carriage reciprocates and the tool changing arm rotates in the opposite direction of the pivot arm when being positioned to align the grasping members with the drilling spindle and tool supply.

4,419,807
TOOL CHANGE DEVICE

Georges Moulin, 17bis rue de Terrenoire, 42100 Saint.Etienne, France

Filed Mar. 2, 1981, Ser. No. 239,536

Claims priority, application France, Mar. 4, 1980, 80 05680; May 23, 1980, 80 12000

Int. Cl.³ B23Q 3/157

U.S. Cl. 29—568 **6 Claims**

1. Tool-changing device adaptable to tool machines, comprising a storage magazine for tools mounted on independent supports and capable of rotating so as to present the selected tool to a gripping means which can disengage the selected tool from its storage position and engage it into the spindle of the machine, characterized in that it comprises:

a base (2);

a cylindrical sleeve (3), having a longitudinal axis of symmetry, supported on said base for non-rotating rectilinear motion in a direction parallel to said axis;

a rotary barrel (6) mounted on and about said sleeve for concentric rotation about said axis;

cheeks (17 and 18) extending outwardly from the opposite ends of said rotary barrel;

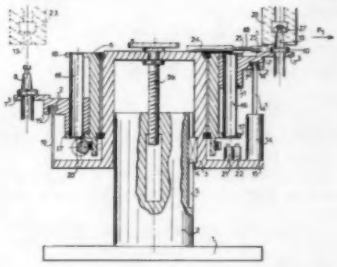
a series of guide pins (16) positioned circumferentially about said axis, with their axes parallel to said axis, and extending between said cheeks;

a corresponding series of annular sectors (7) mounted individually for motion along said pins parallel to said axis and parallel to said rectilinear motion;

each annular sector having means (9) to hold a tool;

each of said annular sectors having a circular tee-shaped groove (7^2) therein, concentric about said axis;

a cylindrical safety ring (19), concentric about said axis and fixed to said cylindrical sleeve by a support (15), said



safety ring having a circular flange (19^1), said safety ring and flange being of such dimension as to be meshable with the tee-shaped groove of an annular sector to thereby hold said annular sector captive against movement parallel to said axis but permit rotational motion about said axis;

said safety ring having a gap in its periphery of extent sufficient to release a one of said annular sectors from captive relationship between the tee-shaped slot in said one of said annular sectors and said safety ring and flange, when said barrel is rotated to bring said one of said annular sectors into alignment with said gap;

a jack (14) mounted on said support (15) and having an actuator (14^2), said jack being located to have its actuator mesh with the tee-shaped slot of a one of said annular sectors while said one of said annular sectors is rotatably positioned at said gap in the safety ring and therefore not captive against movement parallel to said axis;

whereby said jack may move said one of said annular sectors parallel to said axis into a position out of longitudinal alignment with the other sectors;

whereby the tool held by said one of said annular sectors is positioned in space at a unique location, remote from positions in which tools are stored in other annular sectors.

4,419,808

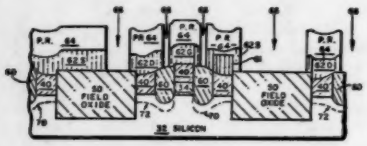
METHOD OF PRODUCING REDUNDANT ROM CELLS

Matthias L. Tam, Monterey Park, and Frank Z. Custode, Norco, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 216,578, Dec. 15, 1980. This application Sep. 23, 1982, Ser. No. 421,757

Int. Cl.³ H01L *21/225, 21/265*

U.S. Cl. 29—571 **1 Claim**



1. A method for producing an electrically programmable very large scale integrated circuit having at least one redundant read only memory cell comprising the steps of:

forming a gate oxide;

growing field oxide around active regions of a substrate including the region of gate oxide;

forming the gate, source and drain conductors of doped polysilicon;

forming source and drain regions on opposite sides of the gate;

forming a layer of undoped polysilicon on the doped polysilicon drain; and,

forming contacts to the gate, source and drain whereby the layer of undoped polysilicon on the drain comprises a resistor connected in series with the drain.

4,419,809

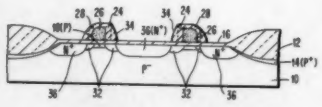
FABRICATION PROCESS OF SUB-MICROMETER CHANNEL LENGTH MOSFETS

Jacob Riseman, and Paul J. Tsang, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,893

Int. Cl.³ H01L *21/265*

U.S. Cl. 29—571 **26 Claims**



1. Method of forming short channel length field effect transistors comprising:

forming a first polycrystalline silicon layer on a silicon dioxide coating on the surface of a monocrystalline silicon substrate of on conductivity type;

forming a silicon nitride layer over said first layer;

removing portions of said insulator layer and said first polycrystalline silicon layer down to said silicon dioxide coating to produce openings having substantially vertical sidewalls on the remaining said insulator layer and polycrystalline silicon layer;

thermally oxidizing the exposed said sidewalls of said first polycrystalline silicon layer to produce a silicon dioxide layer thereon;

depositing a conductive layer over the various substantially vertical and substantially horizontal surfaces;

anisotropically etching said conductive line layer to substantially remove all of said second layer from the horizontal surfaces while leaving said conductive layer on said vertical surfaces;

oxidizing to form a silicon dioxide layer upon the remaining said conductive layer;

removing the remaining said silicon nitride layer and said first polycrystalline silicon layer to define the gate regions of said field effect transistors by said remaining conductive layer and form the gate electrodes in the said conductive layer;

ion implanting a conductivity imparting impurity of an opposite conductivity type to said one type into said silicon substrate to form the source/drain regions using the said remaining said silicon dioxide layer over said second layer as the mask of the channel of the field effect transistor; and

electrically ohmic contacting said source/drain regions and said gate electrodes.

4,419,810

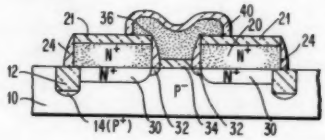
SELF-ALIGNED FIELD EFFECT TRANSISTOR PROCESS

Jacob Riseman, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,892

Int. Cl.³ H01L *21/265*

U.S. Cl. 29—571 **20 Claims**



1. A method of forming self-aligned field effect transistors comprising:

forming a heavily doped conductive layer of one conductivity type upon a monocrystalline silicon substrate of the opposite conductivity type to said one type;

forming an insulator layer upon the surface of said conductive layer;

forming openings with substantially vertical sidewalls through the said conductive layer to said silicon substrate in at least the locations of the planned gates of said field effect transistors;

depositing a uniform thickness conformal insulating layer on said insulator layer over said conductive layer and the exposed said substrate and preferentially removing said insulating layer from the horizontal surfaces and leaving a sidewall insulating layer upon said substantially vertical sidewalls;

wherein the said uniform thickness conformal layer is so chosen to form the desired channel length of said field effect transistors;

heating the structure to form the heavily doped portions of the sources/drains of said field effect transistors of said one conductivity type by outdiffusion from said conductive layer;

oxidizing the exposed said substrate to form the gate insulator of said field effect transistors;

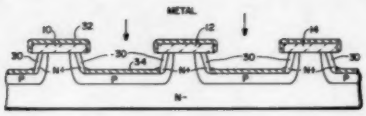
forming the gate electrode for each of said field effect transistors over said gate insulator; and

forming electrical contacts to said conductive layer which are in electrical ohmic contact with said sources/drains through said insulator layer and electrical contacts to said gate electrodes.

4,419,811
METHOD OF FABRICATING MESA MOSFET USING OVERHANG MASK

Edward J. Rice, Los Gatos, Calif., assignor to Aerian, Inc., Los Gatos, Calif.

Filed Apr. 26, 1982, Ser. No. 371,599
Int. Cl.³ H01L 21/22
U.S. Cl. 29—571 4 Claims



1. A method of fabricating a field effect transistor in a body of semiconductor material of first conductivity type comprising the steps of

(a) forming a plurality of spaced layers of insulating material on a major surface of said body constituting a common drain region,

(b) forming regions of opposite conductivity type in said major surface by introducing dopants into exposed portions of said major surface of said semiconductor body,

(c) removing a portion of said region of opposite conductivity by chemical etching thereby forming mesa structures with said spaced layers of insulating material overhanging said mesas,

(d) diffusing a dopant of said first conductivity type into the etched surface of said regions of opposite conductivity type,

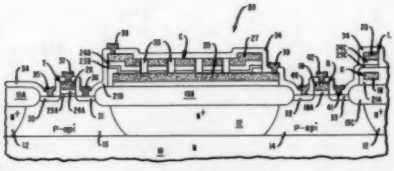
(e) applying a preferential etchant to said etched surface thereby removing said dopant of said first conductivity type except in the side walls of said mesas to form source regions, and

(f) forming conductive metal layers on said plurality of spaced layers to form gate electrodes and conductive layers on said etched surfaces to form source electrodes, said spaced layers overhanging said mesas interrupting said conductive metal layers on said spaced layers from said conductive layers on said etched surface.

4,419,812
METHOD OF FABRICATING AN INTEGRATED CIRCUIT VOLTAGE MULTIPLIER CONTAINING A PARALLEL PLATE CAPACITOR

James A. Topich, Centerville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 23, 1982, Ser. No. 410,674
Int. Cl.³ H01L 21/98
U.S. Cl. 29—571 14 Claims



1. A process for forming a parallel conductive plate capacitor on a semiconductive substrate comprising:

forming a first plate over said substrate;

forming a dielectric layer over said first plate;

forming a second plate having a plurality of windows over said dielectric;

forming windows in said dielectric layer in a corresponding relationship with the windows in said second plate thereby forming a structure in which portions of the first plate which are in correspondence with said windows in the dielectric layer are exposed; and

subjecting the structure to a doping step to dope the entire first plate.

8. A process for forming a conductive polysilicon parallel plate capacitor and a polysilicon gate enhancement mode transistor for a voltage multiplier on a semiconductive substrate of a first conductivity type having an active region of a second conductivity type and a field isolation oxide region, said process comprising:

forming a gate oxide layer over said active region;

doping said active region to adjust the threshold voltage;

forming a first polysilicon layer over said gate oxide;

patterning said first polysilicon layer into a transistor gate electrode corresponding to said active region and a first plate of the capacitor corresponding to said field oxide region;

forming an isolation oxide layer over said structure;

selectively removing the isolation oxide over a central portion of the first polysilicon capacitor plate;

forming a dielectric layer over the structure;

forming a second polysilicon layer over said dielectric layer;

patterning said second polysilicon into the second capacitor plate having a plurality of holes therein;

patterning said dielectric layer into the capacitor insulator having a plurality of holes in correspondence with the holes in said second polysilicon capacitor plate;

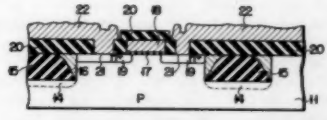
removing said isolation oxide to expose said gate electrode and said active region; and

thermally diffusing or ion implanting active impurities of the first conductivity type to dope said first and second polysilicon capacitor plates and said gate electrode and form a source and a drain in self-aligned relationship with said gate electrode.

4,419,813
METHOD FOR FABRICATING SEMICONDUCTOR DEVICE

Hiroshi Iwai, Takaidonishi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 27, 1981, Ser. No. 325,375
Claims priority, application Japan, Nov. 29, 1980, 55-168584; Nov. 29, 1980, 55-168585
Int. Cl.³ H01L 21/225
U.S. Cl. 29—576 W 26 Claims



1. A method of providing a deep element isolation region in a semiconductor device having a semiconductor substrate during manufacture of the device, comprising the steps of:

(a) forming a pattern of a masking material on the semiconductor substrate, and forming a groove in said semiconductor substrate by using the patterned masking material as a mask;

(b1) forming a first insulating film in said groove in such a degree as to leave V-shaped gaps on both sides of said first insulating film, each said gap being surrounded between a side wall of the groove and said first insulating film;

(b2) removing said masking material together with said first insulating film formed thereon to leave said first insulating film only in said groove;

(c) forming a second insulating film on the surface of said semiconductor substrate including said groove; and

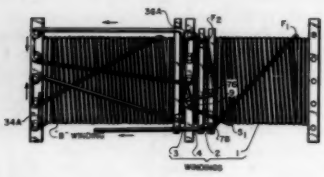
(d) forming an isolation region substantially in said groove by removing a surface layer of said second insulating film.

4,419,814

METHOD OF MAKING A BOBBIN CONSTRUCTION FOR AUTOTRANSFORMER BALLAST

Simon Hasserjian, Willowdale, Canada, assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 15, 1981, Ser. No. 311,568
Int. Cl.³ H01F 41/06
U.S. Cl. 29—605 1 Claim



1. A method of fabricating an autotransformer ballast comprising the steps of:

(1) forming a single bobbin for accommodating a main primary winding and a main secondary winding, each having a large number of turns, and additional filament windings, each having a number of turns much smaller than the turns for the main winding;

(2) said bobbin being defined by a tube adapted to accommodate a core, said bobbin being divided into sections along its longitudinal axis for receiving the respective windings;

(3) further comprising the step of forming individual transverse dividers having a larger cross sectional area than said tube, thereby providing discrete bounded sections for the respective windings;

(4) forming terminal pins upstanding from certain ones of said dividers so as to enable electrical connections from said windings while permitting continuously forming the windings, said terminal pins being formed in two aligned groups spaced along individual dividers;

(5) and, in which the windings, which are designated the main secondary winding, filament windings **3**, **4**, and **2**, and main primary winding are formed and spaced in order along the longitudinal axis of said bobbin, being continuously formed with respect to the terminal pins, which are designated the first pin through fifth pin for the first group in front-to-back order, and sixth pin to ninth pin for the second group in reverse order; in accordance with the following.

starting at the first terminal pin in the first group of pins, winding the main secondary or B winding, continuing by wrapping around the second pin of the first group, thence around the third pin, thence around a first support post; thereafter winding filament winding three, thence proceeding around the fifth terminal pin, thence the fourth pin, thereafter the eighth pin of the second group of pins;

from the eighth pin, winding filament winding four, continuing around the seventh pin, thence the sixth pin, and around a second support posts; thence, winding the filament winding two, thence proceeding around a third support and then the ninth pin; thence winding the first main winding, continuing around a fourth support post to terminate at the point of beginning;

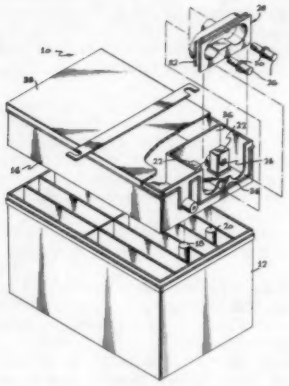
thereafter, cutting the wire between the second pin and the third pin, between the fourth pin and the fifth pin, whereby the desired electrical configuration is obtained.

4,419,815

METHOD OF MAKING AN AIRCRAFT BATTERY

David L. Rorer, and Jasper E. Hardin, both of Redlands, Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 236,670, Feb. 23, 1980, Pat. No. 4,337,301.
This application Dec. 21, 1981, Ser. No. 333,041
Int. Cl.³ H01M 2/06
U.S. Cl. 29—623.2 1 Claim



1. A method of making an aircraft battery comprising the steps of:

installing and interconnecting battery plates within a casing;

attaching a pair of connector posts to the plates so that the posts project above the top surface of the casing;

providing a cover having a pair of lugs molded therein, each lug including an aperture extending vertically therethrough and a threaded nut cast within the lug so that its axis is horizontally disposed, the cover also including a slot in the wall of the cover, the slot having three sides and an opening at the top edge of the cover;

fastening the cover to the top of the casing so that the posts extend through the apertures in the lugs;

affixing the posts to the lugs;

sealing the cover to the casing;

providing a receptacle having a groove along its outer edge and two apertures extending horizontally therethrough;

sliding the receptacle into the slot in the wall of the cover so that the receptacle groove engages the sides of the slot;

providing a pair of terminal pins each having a threaded end and having a surface thereon adapted to receive a wrench for rotating it about its axis;

inserting the threaded ends of the pins through the apertures in the receptacle;

threading the threaded ends of the pins into the nuts cast within the lugs; and tightening the pins by means of a wrench bearing on the surface of the pin adapted to receive the wrench.

4,419,816

DEVICE FOR PRODUCING AN OBJECT CONSISTING OF AT LEAST TWO PARTS MOVABLE RELATIVE TO ONE ANOTHER ONE OF WHICH IS SUBSTANTIALLY ENCLOSED WITHIN THE OTHER

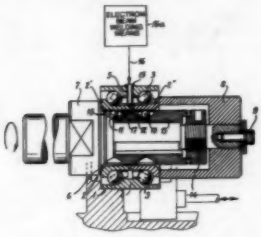
Hendrikus J. Kapaan, Nieuwegein, and Martin B. Verburgh, Amersfoort, both of Netherlands, assignors to SKF Industrial Trading & Development Company B.V., Nieuwegein, Netherlands

Division of Ser. No. 98,535, Nov. 29, 1979, Pat. No. 4,330,911. This application Mar. 1, 1982, Ser. No. 353,069

Claims priority, application Netherlands, Nov. 27, 1978, 7811624

Int. Cl.³ B21D *53/10*

U.S. Cl. 29—724 **3 Claims**



1. A device for assembling a bearing having an outer race ring, at least a pair of separate inner side by side race rings defining therebetween a parting line, a plurality of rolling elements in the annular space between the inner and outer race rings and a radially extending opening in the outer race ring aligned with the parting line of the inner rings comprising means for supporting the bearing elements to rotate the inner rings and maintain the outer rings stationary including a rotatable spindle having a guide or centering means engageable in the bore of the inner rings and a circumferential radial extending shoulder adapted to engage the axial end face of one said inner race rings, a cup member engageable over the free end of the spindle and engageable with the outer axial end face of the other inner race ring and means for adjusting the cup member axially thereby to clamp the inner race rings between the shoulder of the spindle and the cup member and electron beam welding means positioned to direct an electron beam through the opening in the outer race ring whereby upon rotation of said spindle and said inner race rings, the inner race rings are joined by welding at said parting line.

4,419,817

ELECTRICAL HARNESS FABRICATION APPARATUS

Jack F. Funcik, Downers Grove, and Clarence Kolanowski, LaGrange, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Oct. 13, 1981, Ser. No. 310,479

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—749 **2 Claims**

1. In a machine for making an electrical harness, said harness comprising at least one connector with insulation displacement type contacts loaded therein, each contact connected to an insulation clad wire, each wire being of the same length, said machine including:

a first station whereat a connector is initially positioned;

a second station remote from said first station;

holding means mounted at said second station for selectively gripping said wires;

insertion means mounted at the second station for simultaneously displacing each wire into its corresponding contact;

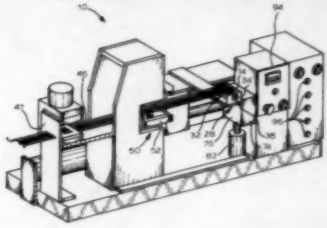
a connector carrier for mounting the connector thereon in a given disposition removable between said first station and said second station in alignment with said wires;

holding means mounted at said second station for selectively gripping said wires;

wire cutting means mounted at the second station for cutting the wires to the same length;

wire pulling means for imparting a force upon said cut lengths of wire for pulling said wire lengths from the second station and stripping the cut insulation segment from each end thereof;

control means for sequentially actuating said insertion means, holding means, wire cutting means, connector carrier and wire pulling means in a given order, said control means moving said connector carrier from said first station to said second station, actuating said insertion means so that said wires are displaced in their corresponding contacts, releasing said wire holding means, moving said connector carrier back to said first station drawing



wire therewith, actuating said wire holding means, actuating the wire cutting means and the wire pulling means to form a completed electrical harness.

the improvement in said wire pulling means comprising:

a reciprocally mounted stripping block having a limiting surface defining the furthest limit of the first station away from said second station, said stripping block being movable in a path of travel generally transverse to the path of travel of the path of the connector carrier between a first position in the path of travel of the connector carrier whereby the connector carrier would abut said limiting surface when at the first station and a second position out of the path of travel of the connector carrier whereby said connector carrier would be able to travel past said first station in a direction away from the second station; and

said control means moving the stripping block to its second position to allow said connector carrier to travel past said first station and exert a longitudinal force against said wires.

4,419,818

METHOD FOR MANUFACTURING SUBSTRATE WITH SELECTIVELY TRIMMABLE RESISTORS BETWEEN SIGNAL LEADS AND GROUND STRUCTURE

Dimitry G. Grabbe, Lisbon Falls, Me., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 26, 1981, Ser. No. 314,921

Int. Cl.³ H05K *3/30*

U.S. Cl. 29—832 **3 Claims**

1. A method of manufacturing a semiconductor chip carrier comprising the steps of:

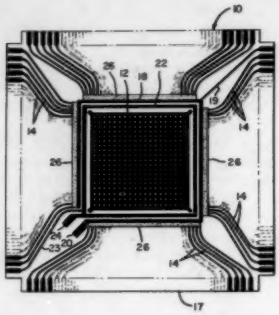
(a) providing a dielectric substrate;

(b) bonding signal leads and at least one ground bus on said substrate;

(c) bonding resistive material on said substrate connected between said signal leads and said ground bus;

(d) selectively removing said resistive material to form discrete paths of desired resistance between at least some of said signal leads and said ground bus,

(e) placing a semiconductor chip on said substrate adjacent said ground bus; and



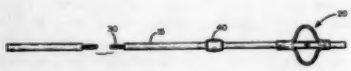
(f) connecting at least some of said signal leads to said semiconductor chip by means of an elevated conductor passing over said resistive material and said ground bus.

4,419,819

METHOD OF MAKING BIOMEDICAL LEAD WITH LOBED LEAD ANCHOR

Eugene A. Dickhudt, and Roger A. Paulson, both of New Brighton, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 29, 1982, Ser. No. 344,123
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—857 **5 Claims**



1. A method of making a body implantable lead of the type having an exposed electrode attached to a lead body comprising a conductor connected to said electrode and an insulating casing enclosing said conductor, and a lead anchor having lobes attached to said lead casing, comprising the steps of:

providing a tube of pliable material substantially inert to body fluids, said tube being longer than the length of lobes desired and shorter than said lead body, having an inside diameter substantially equal to the outside diameter of the lead casing at the position it is desired to locate said lead anchor and having a plurality of slits in said tube in a direction substantially parallel to the axis of the tube, each slit extending from a point distal from the proximal end of the tube to a point proximal from the distal end of the tube and having a slit length equal to the lobe circumference desired;

slipping said tube over said lead casing and positioning it at the location at which the lead anchor is desired;

compressing the tube in a direction parallel to its axis to expand the slit portion of the tube into lobes; and while the tubing is in said compressed condition,

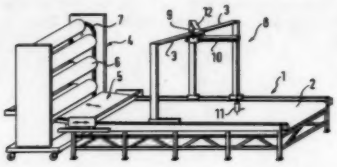
securing said tubing to said lead casing at at least one point proximal to said slits and at least one point distal to said slits.

4,419,820

MATERIAL CUTTING MACHINE

Günter O. Stumpf, Ostendstrasse 13, 7432 Urach 1, Fed. Rep. of Germany

Filed Mar. 4, 1982, Ser. No. 354,777
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1981, 8108075[U]
Int. Cl.³ B23K *15/00*
U.S. Cl. 30—124 **8 Claims**



1. A cutting machine for single or multiple layer webs which are deposited on a laying table, said machine comprising:

(a) a frame, said frame mounted for linear movement along said laying table, said frame having at least two vertical arms and a horizontal upper arm joining said vertical arms;

(b) a rotatable element mounted on said horizontal arm for rotation about a vertical axis;

(c) a linear guide means mounted for reciprocal movement in said rotatable element, said guide means pivotable in a horizontal plane to all sides of said table;

(d) a cutting means for rotation at one end of said guide means,

whereby said cutting means may be rotated, reciprocated along an axis defined by said guide means, pivoted in a horizontal plane, and linearly displaced to reach any point in a horizontal plane defined by said table.

4,419,821

SHEARING UNIT

Colin C. Anderson, 6 Montrose Pl., Beaumont, Adelaide, Australia

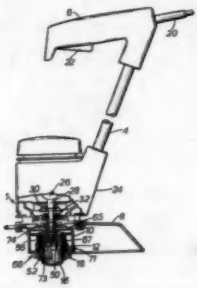
PCT No. PCT/AU80/00110, § 371 Date Aug. 18, 1981, § 102(e) Date Aug. 18, 1981, PCT Pub. No. WO81/01678, PCT Pub. Date Jun. 25, 1981
PCT Filed Dec. 18, 1980, Ser. No. 293,637
Claims priority, application Australia, Dec. 18, 1979, PE1756
Int. Cl.³ B26B *19/24*
U.S. Cl. 30—276 **7 Claims**

1. A shearing unit for shearing wool from a pelt or skin of a sheep, said unit comprising a head having an endless cutting blade, means to drive said endless cutting blade, and a comb to space said blade from the pelt or skin, characterised in that said comb essentially provides no support or restraint on the fibres of the wool and said endless cutting blade is provided with a serrated cutting edge, the serrations being of a size corresponding to that produced by a grinding stone selected within the range of 30 to 120 grit, whereby at high cutting speeds said serrated edge cuts the wool by the serrations impacting on the unsupported and unrestrained fibres of the wool.

4,419,822
BUMP-FEED TRIMMER

David Harris, Wolsingham, England, assignor to Black & Decker Inc., Newark, Del.

Filed Jan. 12, 1982, Ser. No. 338,838
Claims priority, application United Kingdom, Jan. 14, 1981, 8101099
Int. Cl.³ B26D 1/12
U.S. Cl. 30—276 17 Claims



16. A cutting element holder, for use in a bump-feed string trimmer or the like, comprising:

a cylindrical sleeve defining a central axis and having an outwardly extending flange at each end thereof to define an annular compartment;

a coil of flexible cutting element wound in said annular compartment;

a dome-like protrusion extending axially and centrally from one of the flanges on the opposite side thereof to said sleeve and having a cylindrical side wall coaxial with said sleeve;

said cylindrical side wall having an outside diameter smaller than the internal diameter of said cylindrical sleeve;

said one flange having a plurality of inwardly extending radial arms with the inner ends of said arm connected to said side wall, said arms defining recesses therebetween with said recesses extending into said one flange radially outwardly of said side wall; and

said side wall having a plurality of window-like slots therein formed completely through said side wall from the inside to the outside thereof, said slots communicating with said recesses and extending completely through said side ball axially from said recesses;

whereby in use said cutting element holder is slidably and releasably mounted on a sleeve-like escapement member of a bump-feed string trimmer in which the escapement member has externally threaded axial fingers adapted to slidably engage through said recesses into said slots with externally threaded portions of said fingers disposed radially outwardly of said side wall for engagement by a locking nut encircling the outside of said side wall.

4,419,823
PROGRAMMABLE BRAKING DEVICE

Gustav Thorban, Satteldorf, Fed. Rep. of Germany, assignor to Marabuwerke Erwin Martz GmbH & Co., Fed. Rep. of Germany

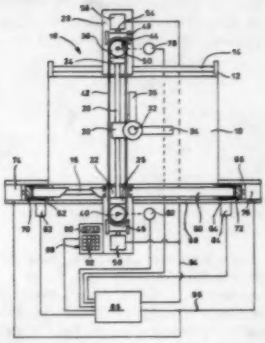
Filed May 19, 1982, Ser. No. 379,780
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1981, 3124540
Int. Cl.³ B43L 13/02
U.S. Cl. 33—1 M 17 Claims

1. A programmable braking device for a guide block that serves to move the drafting head of a drafting machine, which comprises:

(a) at least one sensor that senses the actual coordinate position of the guide block,

(b) an input unit for inputting the desired coordinate position of the guide block,

(c) a computing circuit to which the output signals emitted by the sensor of (a) and the input unit of (b) are applied and which provides an output signal if the actual position of the guide block is identical with the desired position of the guide block,



(d) a servo-braking device interconnected with said guide block which servo-braking device is activated by the output signal emitted by said computing circuit to thereby lock the guide block against further movement,

(e) draw means that move around pulleys,

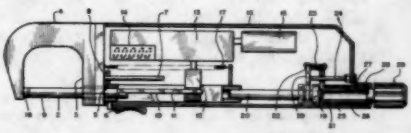
(f) said draw means that move around pulleys being connected to said guide block, and

(g) said servo-braking device being positioned close enough to said draw means that move around pulleys so that there is engagement thereof when the guide block is to be locked against further movement.

4,419,824
DIGITAL ELECTRICAL LENGTH MEASURING INSTRUMENT

Johann Oberhans, Buchoster, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jul. 30, 1982, Ser. No. 403,800
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 3131673
Int. Cl.³ G01B 3/18
U.S. Cl. 33—143 L 14 Claims



1. In a digital, electronic length measuring instrument of the type comprising a bow, an anvil mounted to the bow, a measuring bolt continuously and directly slidable with respect to the anvil in a longitudinal direction, and a transducer which comprises means for sensing the longitudinal position of the bolt, the improvement comprising:

a locking coupler having locked and unlocked orientations;

means for connecting the locking coupler with the bolt such that the bolt is rigidly clamped in position with respect to the locking coupler in the longitudinal direction when the lock-

ing coupler is locked, and the bolt is freely slidable with respect to the locking coupler when the locking coupler is unlocked; and

means for rigidly securing the locking coupler in place with respect to the anvil and for applying a predetermined measuring force on the locking coupler in the direction of the anvil;

said locking coupler, connecting means, and securing means cooperating to lock the bolt securely in place with respect to the anvil and to apply a substantially constant measuring force to the bolt to bias the bolt against an object being measured between the anvil and the bolt.

4,419,825

HEIGHT GAUGE

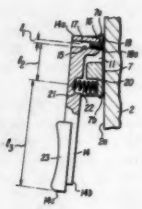
Shigeo Miyamoto, Utsunomiya, Japan, assignor to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

Continuation of Ser. No. 170,061, Jul. 18, 1980, abandoned. This application Mar. 31, 1982, Ser. No. 363,808

Claims priority, application Japan, Jul. 23, 1979, 54-101648

Int. Cl.³ G01B 5/02

U.S. Cl. 33—169 R **2 Claims**



1. A height gauge comprising:

A. a vertical main beam having an end face; and

B. a slider having an upper edge portion, slidably mounted on the main beam, said slider carrying a scriber and a feed screw; and

C. a clamp body slidably mounted on the main beam and attached to the slider by means of the feed screw; said clamp body comprising:

(1) a clamp lever pivotally mounted on the clamp body; said clamp lever having a beam-contacting end and a finger-contacting end, wherein the beam-contacting end has a rotatable eccentric cam which engages the adjacent face of the main beam and by being rotated adjusts the force between the clamp lever and main beam; and

(2) said clamp lever having a finger grip, wherein said finger grip is extended up to the upper side portion of said slider; and

(3) said clamp lever pivoting about an axis parallel to the end face of the main beam, about a spring pin, wherein the axis is in close proximity to the eccentric cam; and

(4) the beam-contacting end of said clamp lever being urged toward the beam by a spring held under compression between the clamp lever and clamp body;

wherein the distance from the center of said compression spring to the finger-contacting end of said clamp lever is greater than the distance from the contact point of said eccentric cam and said spring pin pivot point.

4,419,826

DIAL GAUGE WITH RELEASING MEANS

Yoshiro Kanda, Butohmachi, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1981, Ser. No. 310,679

Claims priority, application Japan, Oct. 23, 1980, 55-151519

Int. Cl.³ G01B 3/22

U.S. Cl. 33—172 R **10 Claims**

1. In a dial indicator having release means, comprising an inner frame means, a spindle extending through said inner frame means and having opposite end portions projecting from opposite sides of said inner frame means, a contact point on one end portion of said spindle and adapted to contact a workpiece, a pointer coupled to said spindle for indicating the position of said contact point and an outer frame means mounted on said inner frame means, the improvement comprising wherein a connecting plate is detachably mounted on the other end portion of said spindle by means of a set screw, a release comprises an elongated tube and a wire means slidably movable longitudinally within and with respect to said tube, said tube being affixed to said connecting plate and said wire means abutting against the outer peripheral portion of said inner frame means, and said inner frame means comprises a cylindrical inner frame and said outer frame means is a bezel releasably fixedly mounted on said inner frame by means of a clamp screw.

4,419,827

MODULAR DEVICE FOR AUTOMATIC DIMENSIONAL GAUGING OF ROTATION PARTS

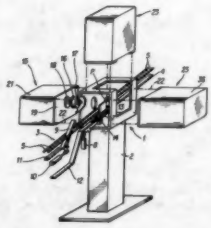
Roland Gluza, Bazainville, France, assignor to Regie Nationale Des Usines Renault, Boulogne-Billancourt, France

Filed Oct. 29, 1981, Ser. No. 316,280

Claims priority, application France, Nov. 6, 1980, 80 23746

Int. Cl.³ G01B 7/12

U.S. Cl. 33—174 L **6 Claims**



1. A fixture for the automatic gauging of parts having the shape of a solid of revolution, said fixture comprising:

a hollow chassis having perforated sides that include a plurality of tooled reference surfaces;

a support module including a base fixed to one of said reference surfaces;

a spindle supported in said support module for rotational and

translational movement, one end of said spindle extending into said chassis;

a mandrel for grasping and carrying said parts, fixed to said spindle;

at least one gauge module, each said at least one gauge module fixed to one of said reference surfaces;

a feeler assembly movably mounted in each said at least one gauge module for movement between an inactive position and an active position wherein said feeler assembly is positioned adjacent a part held by said mandrel; and

a chute passing through said chassis for bringing said parts to said mandrel, the position, height and width of said chute being adjustable for adaptation to various types of said parts.

4,419,828

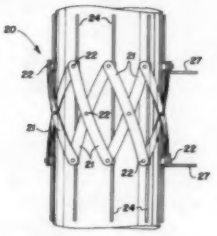
APPARATUS FOR ESTABLISHING THE JUNCTION CONTOUR FOR INTERSECTING PIPES

David L. Farris, Rte. 1, Box 43D, Leesburg, Tex. 75451

Filed May 19, 1981, Ser. No. 265,176

Int. Cl.³ G01B *5/20*

U.S. Cl. 33—175 **4 Claims**



1. Apparatus for establishing, for a main and a lateral to be joined in intersecting relation, the contour of a mating junction; said apparatus comprising

an adjustable simulator having circumferentially spaced, axially-slidable rods for defining the outer diameter of said lateral; said simulator comprising an endless pantograph mechanism formed to a tubular configuration;

said rods being disposed on the inner wall of said pantograph mechanism to be placed, pursuant to adjustment of said mechanism, in contiguous relation with the surface of an encircled lateral to define said outer diameter of said lateral;

said pantograph mechanism having circumferentially spaced pairs of axially aligned pivot joints; pivoted bracket means mounted at each of said pivot joints; one of said rods being mounted in each pair of brackets corresponding to each of said circumferentially spaced pairs of pivot joints, whereby said pantograph mechanism supports said rods in circumferentially spaced parallel relation to its longitudinal axis; said rods defining the inner cylindrical surface of said simulator;

means for guiding said simulator adjacent to said main with its longitudinal axis aligned along the projected axis of said lateral;

and said rods being movable into engagement with the surface of said main to establish said contour.

4,419,829

HEAD FOR BORE GAUGE

Mark H. Miller, Johnston, R.I., assignor to Federal Products Corporation, Providence, R.I.

Filed Jul. 31, 1981, Ser. No. 288,985

Int. Cl.³ G01B *5/08, 7/12*

U.S. Cl. 33—178 R **26 Claims**

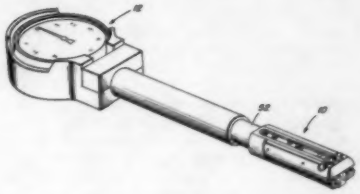
1. A head for a bore gauge having a movable member therein adapted to produce an indication of measurement corresponding to the extent of displacement of said member, said head comprising

(a) a body;

(b) connecting means for operatively connecting said body to said gauge;

(c) a transfer rod mounted for limited longitudinal movement in said body and drivingly connected at one end to said member;

(d) a bore-engaging sensing member movably mounted to the distal end of said body and drivingly connected to the other end of said rod;



(e) an adjustable bore-engaging element mounted to the distal end of said body on the opposite side of said head in diametrical alignment with said sensing member;

(f) manually actuated rack and pinion means operatively associated with said element for exending and retracting said element diametrically to and away from said body;

(g) centralizing means connected to said body for engaging the walls of said bore and positioning said sensing member and said element along the diameter of said bore; and

(h) locking means mounted to said body and engageable with said element for locking said element at a selected position.

4,419,830

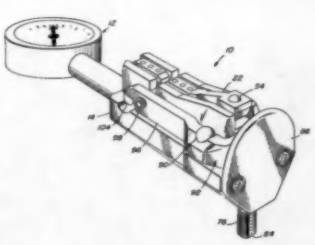
BORE GAUGE HEAD ASSEMBLY

Mark H. Miller, Johnston, R.I., assignor to Federal Products Corporation, Providence, R.I.

Continuation-in-part of Ser. No. 288,985, Jul. 31, 1981. This application Mar. 11, 1982, Ser. No. 356,947

Int. Cl.³ G01B *5/12*

U.S. Cl. 33—178 R **9 Claims**



1. A head for a bore gauge having a movable member therein adapted to produce an indication of measurement corresponding to the extent of displacement of said member, said head comprising:

(a) a body;

(b) connecting means for operatively connecting said body to said gauge;

(c) a transfer rod mounted for limited longitudinal movement in said body and drivingly connected at one end to said member;

(d) a bore-engaging sensing member movably mounted to the distal end of said body and drivingly connected to the other end of said rod;

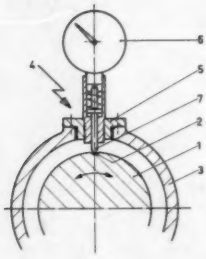
(e) an adjustable bore-engaging element mounted to the distal end of said body on the opposite side of said head in diametrical alignment with said sensing member;
(f) said body being formed with a tapped hole coaxial with said alignment and a threaded stem disposed in said hole, said element mounted on the outer end thereof whereby rotation of said stem will selectively extend or retract said element diametrically to and away from said body and said sensing member;
(g) a measurement scale located lengthwise along said stem for visually indicating the extension of said stem from said hole;
(h) centralizing means connected to said body for engaging the walls of said bore and positioning said sensing member and said element along the diameter of said bore;
(i) a locking nut mounted to said stem and engageable with said body for locking said stem at a selected position;
(j) said other end of said transfer rod being formed with a diagonally extending V groove, said sensing member being resiliently and pivotally mounted to said body and including a spherical portion seated in said groove whereby any pivotal movement of said sensing member is converted to a linear movement of said rod; and
(k) a support member mounted to said body transversely of said rod and engaging said rod along one side thereof adjacent said other end and opposite said groove to provide sliding support for said rod.

4,419,831

METHOD AND APPARATUS FOR REPRODUCIBLY ASSOCIATING TWO MECHANICAL ELEMENTS WHICH ARE MOVABLE RELATIVE TO EACH OTHER

Ernst Zimmer, Friedberg, Fed. Rep. of Germany, assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 6, 1979, Ser. No. 45,880
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 2825581
Int. Cl.³ G01B *5/00*
U.S. Cl. 33—181 R **4 Claims**



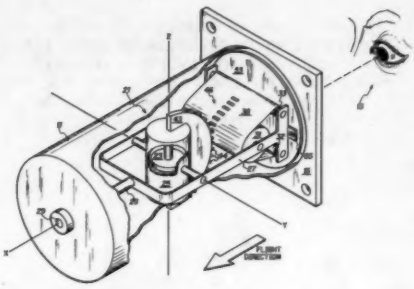
1. An apparatus for reproducibly establishing a mechanical zero position for two relatively movable parts of an industrial robot, comprising:
a tubular receiving part;
a shaft part rotatably mounted in said tubular receiving part and having a circumferential surface and one radial position with a single notch at a lower radial position having a relatively small circumferential extent with respect to said circumferential surface; and
a dial gauge fixed to said tubular receiving part over said circumferential surface of said shaft part, said dial gauge having a movable dial and a sensing needle operatively connected to said movable dial for moving said dial with movement of said needle, said needle engaged with said circumferential surface and positioned to engage in said notch with each full rotation of said shaft part so that said dial remains motionless as said shaft part rotates with said needle engaged on said circumferential surface and moves only when said needle engages said notch;
whereby movement of said dial indicates the mechanical zero position between said tubular part and said shaft part.

4,419,832

AIRCRAFT ATTITUDE DISPLAY INSTRUMENT

Donald F. Schmidt, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 8, 1982, Ser. No. 346,452
Int. Cl.³ G01C *19/00*
U.S. Cl. 33—329 **11 Claims**



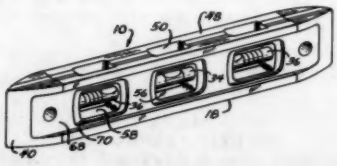
1. An attitude indicator instrument for aircraft comprising:
gyroscopic first means having a spin axis which is capable of angular movement, relative to said aircraft, about a further axis,
second means comprising a strip of material suitable for bearing visible markings, said strip containing perforations and being formed into a closed loop,
third means for supporting, and allowing movement of, said second means, said third means defining a path around which said second means may travel,
fourth means for engaging said perforations, and
fifth means for coupling said fourth means with said first means such that angular movement of the spin axis relative to the aircraft causes movement of said fourth means which in turn drives the second means around its path in a direction opposite to the angular movement of the spin axis.

4,419,833

COMPOSITE LEVEL CONSTRUCTION

Randall J. Wright, 9150 W. Hawthorne, Milwaukee, Wis. 53226

Filed Jan. 24, 1983, Ser. No. 460,160
Int. Cl.³ G01C *9/32*
U.S. Cl. 33—379 **10 Claims**



8. An instrument for determining level or pitch relationships comprising:
(a) a level or pitch vial;
(b) a metal frame having a first planar working surface and an upstanding web, the web including means for position-

ing and for retaining the vial in a predetermined angular relationship with respect to the first planar working surface;

(c) a plastic element having a second planar working surface; and

(d) means for automatically aligning the plastic element and the plastic second planar working surface in a predetermined angular relationship with respect to the vial, wherein the means for aligning the plastic second working surface in the predetermined second angular relationship to the vial includes means for aligning said plastic second working surface in a predetermined third angular relationship with respect to the first working surface, the first and third predetermined angles defining the second predetermined angular relationship and wherein the means for aligning the plastic second working surface in third predetermined angular relation-ship includes level instrument end caps secured to the ends of the frame in predetermined relationship with respect to the first working surface, means positioning the plastic second working surface in predetermined relationship with respect to the end caps.

4,419,834

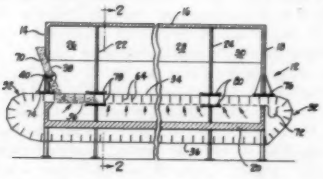
TREATING FLUIDIZED MATERIAL

John F. Scott, Oreland, Pa., assignor to Proctor & Schwartz, Horsham, Pa.

Continuation of Ser. No. 177,190, Aug. 11, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,923

Int. Cl.³ F26B *17/04*

U.S. Cl. 34—57 A **5 Claims**



1. A fluid bed apparatus for controlled residence treating of particulate material comprising

means defining an enclosed treating chamber;

a foraminous support extending longitudinally within said chamber for supporting a bed of material within the chamber, said support having an exit end;

gas supply means beneath said foraminous support; means for supplying gas to said gas supply means under sufficient pressure to levitate the material in said bed and to form a fluidized bed;

a series of spaced-apart flight means substantially coextensive with the fluidized bed movable longitudinally above said foraminous support past the exit end of said support, the lower edges of said flight means being substantially contiguous with the foraminous support and the upper edges of the flight means being no lower than the bed upper surface, thereby moving the entire bed of said material confined by the flight means longitudinally and uniformly along said support to control the residence time of the particulate material in said chamber, said flight means being independent of the support.

4,419,835

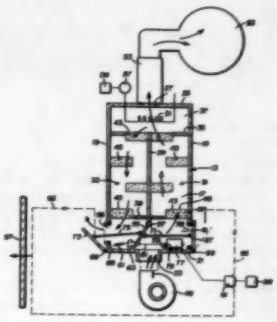
HAIR DRYER

Don R. Strain, Clarkston, Mich., assignor to H.D. Research Company, West Bloomfield, Mich.

Filed Apr. 30, 1981, Ser. No. 259,121

Int. Cl.³ F26B *21/08*

U.S. Cl. 34—80 **7 Claims**



1. A dryer comprising:

an enclosed housing including an air inlet and an air outlet;

opposed first and second flow desiccant bed ducts on each side of said inlet and outlet;

an inlet plenum located between said inlet and said opposed flow ducts and an outlet plenum located between said outlet and said opposed flow ducts;

said inlet and outlet plenums communicating through said flow ducts;

a valve door pivotally supported within said housing having one end extending across said inlet to direct air received from said inlet into one of said flow ducts in a first pivotable position and into said opposite flow duct in a second pivotable position;

door actuating means intermittently pivoting said valve door between said first and second positions to alternately and intermittently direct air into one of said first and second flow ducts;

blower means directing air into said inlet;

said flow ducts each comprising perforated baffle assemblies of loosely packed desiccant material having a low pressure drop across each baffle assembly;

a heater means, positioned within said outlet plenum in the air path therein, adapted for heating the dehydrated air passing through said outlet plenum rendering said dry air more hygroscopic for increased drying of the air passing through said outlet and the air returning through the other of said flow ducts for rapid regeneration of said baffle assemblies;

valve means in said inlet plenum;

said valve means alternately directing air received from one of said flow ducts out of said housing;

said blower means directing air into said inlet;

said valve door and door actuating means alternately and intermittently directing said air into one of said flow ducts, into said outlet plenum, and a large portion of said air out of said outlet;

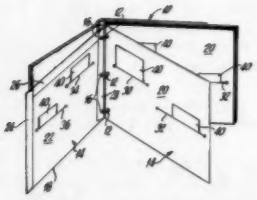
said outlet being a restricted opening and creating a back pressure in said outlet plenum directing a portion of air received from said opposed flow duct into the opposite flow duct; and

said valve means directing said portion of air received from said opposed flow duct out of said housing.

4,419,836
FOOTWEAR IN THE FORM OF A SANDAL
James K. Wong, 46-194 Nona Loop, Kaneohe, Hi. 96744
Continuation of Ser. No. 916,463, Jun. 19, 1978, Pat. No. 4,226,031. This application Jan. 25, 1980, Ser. No. 115,552
Int. Cl.³ A43B 3/12
U.S. Cl. 36—11.5 3 Claims

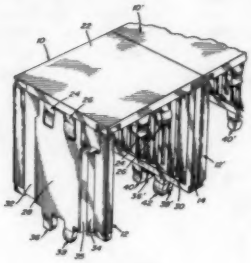
1. A sandal comprising:
a sandal base;
strap means for holding a foot on the base;
said base having a lower surface that slopes upwardly forwardly at the forward portion thereof in a convex curve so that the slope angle gradually increases at progressively more forward locations;
said base lower surface sloping upwardly-rearwardly at the rearward portion thereof in a convex curve so that the slope angle gradually increases at progressively more rearward locations, whereby to avoid splashing onto the sandal when walking at the seashore or other wear areas.

4,419,837
APPARATUS FOR DISPLAYING ADVERTISING MATERIAL
David M. Meeker, Saratoga, Calif., assignor to Champion International Corporation, Stamford, Conn.
Continuation of Ser. No. 808,603, Jun. 21, 1977, abandoned. This application Jun. 24, 1981, Ser. No. 276,877
Int. Cl.³ B65D 27/08
U.S. Cl. 40—359 1 Claim



1. A display carrier for display of a plurality of differently sized sample envelopes in a loose leaf binder, said display carrier being generally rectangular in configuration and consisting of a sheet folded along a medial line thereof to form an envelope engaging first edge and defining a front panel and a back panel, said front panel being of greater area than said back panel and including flaps extending along the three remaining free edges, each flap being folded along its associated edge and bonded to the back panel, said front panel and back panel each having a plurality of differently sized elongated slots formed therein, each said slot in the front panel and back panel being disposed parallel to said envelope engaging first edge of the display carrier, with each of the slots in the front panel and back panel being spaced at different lengths from said envelope engaging first edge, out of alignment with other slots in its respective panel and with the ends of each said differently sized slot terminating in annular openings whereby the differently sized envelopes to be displayed each may be inserted into one of said slots to engage said envelope engaging first edge and thereby be maintained in position for display purposes, the spacing of said slots from said envelope engaging first edge being such as to permit each slot to receive more than half of its respective sample envelope, said display carrier further including aligned, spaced apertures extending through the front panel, back panel, and a flap portion, along one edge disposed perpendicular to said envelope engaging first edge to enable said display carrier to be releasably retained in a loose-leaf binder.

4,419,838
DIAGRAM BOARD ELEMENT
Frank Taylor, St. Eustache, and Klemens Maurer, Candiac, both of Canada, assignors to Monitronik Ltee, Quebec, Canada
Filed Jun. 18, 1982, Ser. No. 390,057
Int. Cl.³ G09F 7/00
U.S. Cl. 40—605 9 Claims

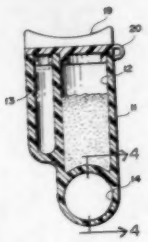


1. An element adapted for connection to components of a diagram board assembly comprising: a rectangular body including at least one pair of depending transversally spaced legs projecting beyond one sidewall of said body and being integral therewith, each leg having an inner face and an outer face and opposite side faces, said outer face including a curved portion; said legs of each pair being substantially in-line so that said all side faces thereof are intersected by an imaginary straight line substantially parallel to said cooperating sidewall; the curved portion of the outer face of one leg of a pair being concave while the curved portion of the outer face of the other leg being convex; and said legs being made of elastic material and mounted to said body so that said legs are flexible in a first direction, which is in a plane perpendicular to the sidewall, and are flexible in a second direction, which is in a longitudinal plane including said pair of legs and imaginary straight line to enable engagement with another component of said assembly.

4,419,839
CHARGE CONTAINER FOR FIREARMS
Hugh R. Wilson, 10840 SW. 120th St., Miami, Fla. 33176
Filed Mar. 19, 1982, Ser. No. 359,746
Int. Cl.³ F42B 39/04; F41C 27/00
U.S. Cl. 42—90 2 Claims

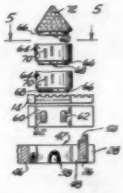
1. In a charge container for use with muzzle loading firearms, said container having a body, said body having chamber means for containing at least one charge component, said chamber means being open at only one side, all other sides of said chamber means being closed, closure means for closing said open side of said chamber means, cap holding means mounted on said closure means for holding a percussion cap, the combination with said body, said chamber means, said closure means and said cap holding means, of projectile holding means, said projectile holding means being mounted on said body and against a closed side of said chamber means, said projectile holding means being substantially of a tubular con-

figuration, for holding a projectile therein, and being open at both ends to allow a bullet starter or ramrod to operate



through said projectile holding means for rapid transferral of a projectile to the bore of the firearm.

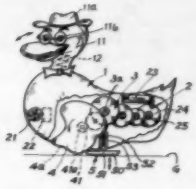
4,419,840
MODULAR MODEL STRUCTURE
Benjamin D. Pope, 831 Jewell, Ferndale, Mich. 48220
Filed Aug. 20, 1981, Ser. No. 294,512
Int. Cl.³ A63H *33/06*
U.S. Cl. 46—19 **16 Claims**



1. A modular model building structure comprising an integrally-formed base module having a plurality of walls connecting together a plurality of open cylindrical base sections, each open cylindrical base section having an inner surface of predetermined inner diameter and an outer surface of predetermined outer diameter, and at least one modular unit, said modular unit having spaced-apart projecting features formed integrally with its exterior surface, said projecting features engaging spaced apart notches on said walls to prevent said modular unit from accidental rotation said modular unit also having a solid cylindrical reduced diameter projection of said predetermined inner diameter size at the bottom edge of said modular unit for inserting said modular unit within the top of one of said open cylindrical base sections, wherein each of said modular units inserted into one of said open cylindrical base sections is removably locked in a predetermined position in relation to said one of said open cylindrical base sections by a transverse notch in said reduced diameter projection being engaged with a transverse rectangular ridge protruding at a right angle from said inner surface towards the center of said one of said open cylindrical base sections.

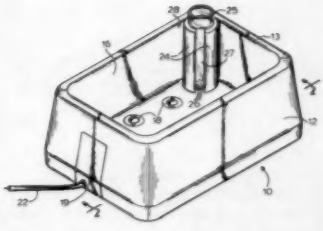
4,419,841
ALTERNATIVELY SWINGING AND TWISTING TOY
Chan-Shiung Huang, 10-4 Fl., No. 62 Chang Chun Rd., Taipei, Taiwan
Filed Sep. 7, 1982, Ser. No. 414,617
Int. Cl.³ A63H *13/02*
U.S. Cl. 46—105 **5 Claims**

1. An alternately swinging and twisting toy comprising:
a main body formed with a pair of side-arm portions respectively mounted on both sides thereof;
a power driving means disposed in said main body;
a power transmitting means transferring the output driving force from said power driving means;
a pair of moving cams receiving the output driving force through said power transmitting means; and
a pair of resilient feet formed on both sides of the bottom portion of said main body, the improvement which comprises:
said pair of moving cams are synchronously driven by said power driving means to alternately, directly engage a supporting surface to cause a swinging motion of said toy,



said moving cams are further, respectively, made to have irregular corrugations along their perimeters and said corrugations on one cam do not superimpose on the corrugations of the other; and said pair of resilient feet, each comprising a foot portion, a supporting leg portion connected on said foot portion, a helical spring backing on said leg portion, and a jacket pipe jacketing said spring and leg and is formed on said main body, whereby said resilient feet auxiliarily increasing the swinging motion of said toy as said toy moves across said supporting surface.

4,419,842
HYDROPONIC PLANTER
Michael Paloian, 7 East Ct., Babylon Village, N.Y. 11702
Filed Feb. 8, 1982, Ser. No. 346,416
Int. Cl.³ A01G *31/00*
U.S. Cl. 47—62 **12 Claims**



1. A hydroponic device, comprising:
a hollow, integrally-formed, one-piece housing having a partition wall separating a substantially closed pressurizable lower chamber which serves to receive a liquid nutrient supply and an upper chamber having a top open end which serves to receive an inert filler material and the desired vegetation, said housing comprising a generally horizontally-disposed lower chamber base wall, an upstanding outer sidewall joined at its lower end to the periphery of said lower chamber base wall, a generally horizontally-disposed upper chamber base wall spaced above said lower chamber base wall which serves as said partition wall, an upstanding inner sidewall joined at its lower end to the periphery of said upper chamber base wall and a generally horizontally-disposed top wall joined to the upper ends of said outer and inner sidewalls, said outer sidewall having a recessed section formed therein

defined in part by a generally horizontally-disposed, inwardly-extending ledge:

at least one nutrient supply pipe coupled to said partition wall and extending downwardly into said lower chamber, said supply pipe having a bore extending therethrough to establish fluid communication between said upper chamber and said lower chamber;

inlet means in said housing ledge for introducing air under pressure into said lower chamber;

an electrically-powered air pump mounted in said recessed section of said housing so that its exposed external surface is substantially flush with the exposed outer surface of said outer sidewall, said air pump being coupled to said inlet means for pumping air into said lower chamber via said inlet means;

drainage means mounted in housing for draining liquid from said lower chamber; and

vent means for releasing a pressure build-up within said lower chamber.

4,419,843

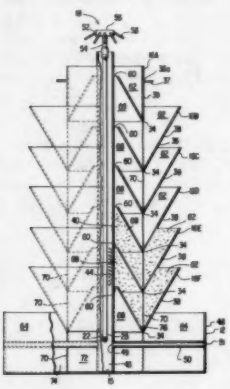
SELF-IRRIGATING, MULTI-TIER VERTICAL PLANTER

Hugh A. Johnson, Sr., P.O. Box 125, Lakeview, Mich. 48850

Continuation-in-part of Ser. No. 245,716, Mar. 20, 1981. This application Jun. 18, 1982, Ser. No. 389,966

Int. Cl.³ A01G *25/00*

U.S. Cl. 47—82 **16 Claims**



1. A self-irrigating planter comprising:

(a) a pan-shaped base member;

(b) an upstanding tubuar post member open at its lower end and vertically secured to the base, said post member being permeable to air and water;

(c) a plurality of trays in a vertical stack coaxial with said post member, each of said trays containing a medium, to at least a level which fills a lower tray to at least the bottom of a next higher tray, for growing plants and having an outer conical wall and an intersecting oppositely-directed inner conical wall and terminating in a circular portion concentric to said post wherein said medium permits the flow of air and moisture therethrough and said tray permits air and moisture to flow between said post member and the exterior of said planter;

(d) each of said trays having an aperture in said bottom to allow liquid to seep into a lower tray or said base member;

(e) a second aperture located in an outer wall portion of each tray to provide an outlet for excess liquid to seep to a lower adjacent tray; and

(f) a liquid distribution means located above said post member.

4,419,844

WEATHERSTRIP

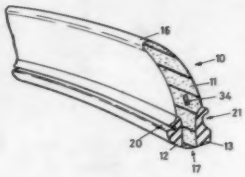
Rudolf P. Kreisfeld, Edwardstown, Australia, assignor to Bridgestone Australia Pty. Ltd., Edwardstown, Australia

Filed Nov. 12, 1982, Ser. No. 440,844

Claims priority, application Australia, Nov. 12, 1981, PF1536

Int. Cl.³ E06B *7/16*

U.S. Cl. 49—475 **5 Claims**



1. A weatherstrip useful for excluding drafts around a door opening of a motor vehicle, having a sponge portion and two dense portions, all of ethylene propylene diene monomer,

the weatherstrip having a constant cross-sectional shape which includes a free sealing end, and a captive end having a pair of oppositely facing retaining recesses for securing of the weatherstrip to a supporting structure,

the sponge portion extending between said ends but being of reduced thickness at its captive end, the reduced thickness captive end being flanked on each side by the dense portions, said dense portions comprising outer surfaces defining the retaining recesses.

4,419,845

METHOD OF AND APPARATUS FOR FINISH-GRINDING A CAMSHAFT

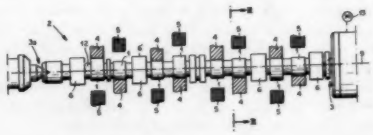
Heinz Voigt, and Martin Wolters, both of Wuppertal, Fed. Rep. of Germany, assignors to Ernst Thielenhaus KG, Wuppertal, Fed. Rep. of Germany

Filed Mar. 23, 1981, Ser. No. 246,704

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1980, 3011454; Mar. 25, 1980, 3011455

Int. Cl.³ B24B *5/04*

U.S. Cl. 51—42 **2 Claims**



1. A method of finish-grinding a rough-ground camshaft having a shaft extending along and defining an axis and carrying a plurality of axially spaced cams each having a cam surface, said method employing for each cam a respective coarse prefinish tool and a respective fine finish tool, said method comprising the stpes of:

rotating said camshaft about said axis;

urging against each cam surface the respective fine finish tool in one radial direction and with a predetermined pressure and the respective coarse prefinish tool with an equal but opposite pressure and in the opposite radial direction, said directions being generally coplanar through said axis and every other finish tool being to one side of said axis on said plane, whereby said tools aternate to either side of said axis in said plane; and

after a predetermined interval withdrawing said coarse prefinish tools radially from contact with said cam sur-

faces while continuing to rotate said camshaft with only said fine finish tools engaging the respective cam surfaces.

4,419,846

APPARATUS FOR GRINDING OPTICAL LENSES

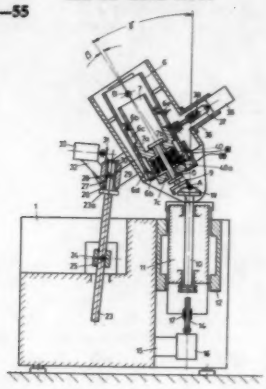
Günter Schimitzek, An der Reute 8, 7923 Konigsbronn, and Horst Reiche, Uhlandstr. 36, 7923 Konigsbronn/Zang, both of Fed. Rep. of Germany

Filed Sep. 18, 1980, Ser. No. 188,372

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1979, 2937976

Int. Cl.³ B24B *13/00*

U.S. Cl. 51—55 **16 Claims**



1. Apparatus for producing convex and/or concave spherical surfaces in workpieces such as optical lenses, comprising

a frame,

a workpiece spindle selectively mounted relative to the frame and having an end face to which is securable a workpiece to be machined to provide a spherical surface of selective radius and having a corresponding apex,

a tool spindle selectively mounted on the frame and carrying a machining tool of correspondingly selective effective diameter relative to the selective radius of the spherical surface of the workpiece for machining the workpiece,

the two spindles being disposed for corresponding rotation at a pre-selective angle to one another, and

angular positioning means including two mutually adjustable members for retaining the tool spindle in its corresponding angular position relative to the workpiece spindle in conformity with such pre-selective angle between the two spindles,

the first of said members being mounted for pivoting about a primary pivotal axis which is tangential to the apex of the spherical surface to be produced, and having a selective effective longitudinal dimension extending from the primary axis,

such first member being adjustably locatable at a preselected angle of inclination initially generally corresponding to such pre-selective angle between the two spindles in dependence upon the selective radius of the spherical surface to be machined,

the second of said members having the tool spindle directly mounted for rotation thereon and being mounted for pivoting about a secondary pivotal axis on the first member,

the pivotal axes of mounting of the two members extending substantially parallel to one another and being spaced apart by a distance corresponding substantially to the effective longitudinal dimension of the first member,

the second member which is pivotable about the secondary axis being locatable at an angular position with respect to a line joining the two axes, which angular position is selected in dependence upon the effective diameter of the machining tool for final accurate angular alignment thereof with respect to the apex of the spherical surface to be produced, and

the first member being in the form of a swivel arm having a pivot mounting end at which such primary axis is located and a free end in opposed relation thereto, and the second member being mounted on the first member and being in the form of a rocker arm, and a spindle sleeve being provided in the rocker arm which receives the tool spindle and which is selectively axially displaceably mounted in the rocker arm for extending therebeyond for adjusting the location of the machining tool relative to the primary axis and apex of the spherical surface to be produced.

4,419,847

DEVICE FOR SUPPORTING AND MOVING A TOOL WITHIN A TAPPING

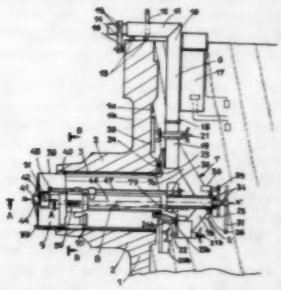
Jean-Benoit Duverne, Le Creusot, France, assignor to Framatome, Courbevoie, France

Filed Apr. 6, 1981, Ser. No. 251,456

Claims priority, application France, Apr. 15, 1980, 80 08430

Int. Cl.³ B24B *5/06*

U.S. Cl. 51—90 **5 Claims**



1. Device for supporting and moving a tool within a substantially horizontal tapping having a symmetry of revolution and traversing a wall so as to be flush with one side of said wall and project from the other side of said wall, said device comprising

(a) supporting and centering means in the form of a star, the arms of which extend radially with respect to the tapping;

(b) centering members carried by said arms for engagement within said tapping;

(c) means for fastening to the wall on the flush side of the tapping supported by the ends of said arms remote from said tapping;

(d) a cylindrical centering bell at the projecting end of said tapping and within the latter, said bell supporting a fluid-tight seal on its outer surface;

(e) end bearings carried by said supporting means and said centering bell, said end bearings having an axis common with the axis of said tapping;

(f) a tool holder bar connected at its ends to two stub shafts aligned along the axis of said tapping, each of said stub shafts being rotatable in one of said end bearings, said tool holder bar being off-set with respect to the axis of said tapping in a radial direction;

(g) means for rotating said tool holder bar about the axis of the tapping; and

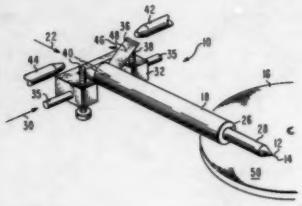
(h) means carried by said tool holder bar for guiding and moving a tool in axial direction and in radial directions of the tapping.

4,419,848

METHOD AND APPARATUS FOR ROTATING A STYLUS DURING LAPPING

William A. Dischert, Jobstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 27, 1981, Ser. No. 297,054
Int. Cl.³ B24B 9/16, 1/00
U.S. Cl. 51—229 12 Claims



1. An apparatus for rotating a stylus while a tip thereof is positioned adjacent a rotating scaife comprising:

a stylus holder mounted on a trunnion and adapted to rotate about a first axis,

means attached to said trunnion for pivoting said trunnion about a second axis transverse to said first axis,

a vane attached to said holder and positioned adjacent said second axis in a manner such that a fluid directed against said vane causes said holder to rotate about said trunnion, and

means for directing a stream of fluid against said vane said position of said vane and said directing means being such that the rotation of said holder is effected without generating a significant additional torque movement about said second axis.

9. A method of rotating a stylus while lapping a tip thereof comprising the steps of:

attaching said stylus to one end of a stylus holder, said holder mounted on a trunnion and adapted to rotate about a first axis,

pivoting said trunnion about a second axis transverse to said first axis, in order to position the tip of said stylus adjacent a surface of a rotating scaife, and directing a stream of fluid against a vane positioned adjacent said second axis and attached to said stylus holder in a manner such that said fluid causes said holder to rotate about said trunnion without generating a significant additional torque movement about said second axis.

4,419,849

LENS PROCESSING METHOD AND APPARATUS

Frank D. Sorrells, Knoxville, Tenn., assignor to Cole National Corporation, Cleveland, Ohio

Filed Feb. 11, 1981, Ser. No. 233,323
The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.
Int. Cl.³ B24B 1/00
U.S. Cl. 51—284 R 5 Claims

1. A method of generating an optical prescription into a lens blank which only requires a single mounting of said lens blank to an associated lens block, said method comprising the steps of:

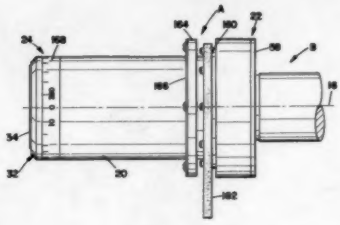
providing a lens blank having a frame center axis and a peripheral size substantially greater than the peripheral size of a finished optical lens to be formed from said lens blank;

providing a reuseable preformed lens block having a peripheral size which is not greater than the peripheral size of said finished optical lens, said lens block including means for mounting same to a chuck and having a longitudinal mounting axis;

affixing said lens block to said lens blank so as to extend outwardly from the face thereof which is opposite to the lens blank face which is to be processed and with said longitudinal mounting axis substantially aligned with said frame center axis;

installing a preselected lens block receiver in operative communication with a chuck coaxially disposed in mounted communication with a tailstock of lens generating apparatus, said lens block receiver including means for locating said lens block so that said lens blank may be placed in a predetermined position relative to said chuck;

placing said lens block in operative mounted communication with said lens block receiver such that a desired optical center axis of said lens blank is located substantially coaxial with the longitudinal axis of said tailstock to thereby



accommodate a predetermined desired amount of lens blank decentration;

generating the desired optical surface on said lens blank processed face and thereafter removing said lens block and lens blank from association with said chuck;

performing subsequent operations for producing said finished optical lens while the same said lens block remains affixed to said lens blank for mounting said lens block and lens blank in subsequent processing apparatus;

said step of performing subsequent operations being carried out without changing the physical characteristics of said lens block; and,

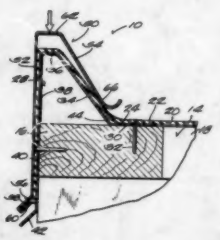
deblocking said finished optical lens from said lens block for reuse of said lens block in processing other lens blanks.

4,419,850

GRAVEL CURB

William J. Butzen, Menomonee Falls, Wis., assignor to Metal Era, Inc., Waukesha, Wis.

Continuation of Ser. No. 151,302, May 19, 1980. This application Feb. 2, 1982, Ser. No. 345,047
Int. Cl.³ E04D 3/40
U.S. Cl. 52—60 9 Claims



1. A roof edging mechanism for providing a dam at the edge of a roof and for securing the edge of a rubber membrane overlying the roof in place, the roof edging mechanism comprising

a dam means adapted to be secured to the edge of a roof, the dam means including an inclined portion having a lower edge engaging the roof and having an upper edge, and a vertical portion having an upper edge connected to the upper edge of the inclined portion, said vertical portion having a lower edge spaced from said lower edge of said inclined portion, and said dam being adapted to support a rubber membrane thereon, and

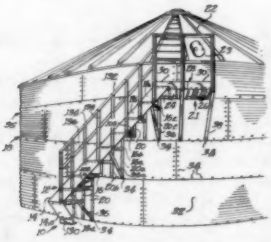
a fascia for covering at least a portion of said dam means and for clampingly engaging said rubber membrane where said lower edge of said inclined portion of said dam means engages the roof, said fascia including a vertical portion adapted to overlie said vertical portion of said dam means, said vertical portion having a lower edge including means adapted to engage the lower edge of said vertical dam portion, to releasably restrain said fascia against upward movement and said vertical portion of said fascia having an upper edge, and an inclined spring portion extending downwardly from said fascia vertical portion upper edge, said inclined spring portion including a lower edge adjacent said lower edge of said inclined portion of said dam means and said inclined spring portion of said fascia being resilient and being constructed such that said lower edge of said inclined spring portion clampingly engages said membrane where said lower edge of said inclined dam portion engages the roof, said fascia being adapted to be forced downwardly over said dam means to clamp said rubber membrane in place on said dam means, and said lower edge of said inclined spring portion being freely slideable on said rubber membrane as said spring means is forced downwardly over said dam means.

4,419,851

STAIR STRUCTURE FOR STORAGE BINS

Joseph A. Kruger, Warsaw, Ind., assignor to Brock Manufacturing, Inc., Milford, Ind.

Filed Jul. 23, 1981, Ser. No. 286,163
Int. Cl.³ E04F *11/00*
U.S. Cl. 52—184 **10 Claims**



1. A stairway system for a wall having a horizontal curvature, the wall being comprised of adjacent overlying wall sections forming overlapping seams therebetween, said system comprising:

a first plurality of adjacent stringer sections adjustably joined to form a single stringer assembly spaced from and conforming substantially to the curvature of said wall;

a second plurality of tread members disposed between the wall and said stringer assembly, each of said members extending from the wall substantially along a radius of said curvature; and

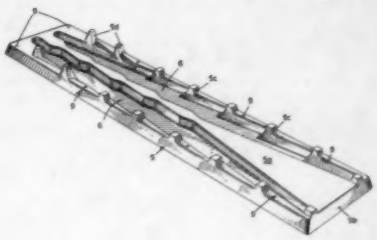
attachment means to secure said tread members to the wall, the attachment means including an array of brackets, each of said brackets being secured to at least one of said tread members and attached to the wall by fastener means disposed in at least one of said overlapping means.

4,419,852

DEVICE FOR PRESERVING CONNECTING BARS FOR CONCRETE STRUCTURAL MEMBERS

Hans Dietrich, Bolligen, Switzerland, assignor to Losinger AG, Berne, Switzerland

PCT No. PCT/CH80/00121, § 371 Date May 28, 1981, § 102(e) Date May 28, 1981, PCT Pub. No. WO81/01025, PCT Pub. Date Apr. 16, 1981
PCT Filed Oct. 2, 1980, Ser. No. 269,048
Claims priority, application European Pat. Off., Oct. 3, 1979, 79810113.5
Int. Cl.³ E04C *1/00*
U.S. Cl. 52—309.16 **7 Claims**



1. A reinforcement device adapted to be attached to a casing on which a steel-reinforced concrete structural member is to be made, said device comprising an elongate holding element made substantially of a thin-walled plastic mold, and reinforcing bars, the end portions of which, bent-off approximately at right angles, are in said element, said elongate holding element defining troughs open toward one side of the element and receiving said end portions therein and cast in an embedding material which is brittle in its solidified state, but does not adhere either to said reinforcing bars or to said element, said device being as a whole a rigid structural unit of permanent shape.

4,419,853

METHOD FOR TREATING THE SURFACE OF A METAL TO IMPROVE THE ADHESION OF A CEMENTITIOUS JOINT COMPOUND THERETO

Friedrich Failmezger, Schaumburg, and Geronimo E. Lat, Skokie, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Sep. 24, 1981, Ser. No. 305,071
Int. Cl.³ C23F *11/00*
U.S. Cl. 52—741 **13 Claims**

1. A method for forming a building structure including a metal structure such as a cornerbead, which comprises forming said metal structure, applying an emulsion comprising a forming lubricant and an aziridine to said metal structure, mounting said metal structure, applying a joint compound to cover said metal structure, and permitting said joint compound to dry.

4,419,854

AUTOMATIC CONTINUOUS VACUUM PACKAGING METHOD AND APPARATUS

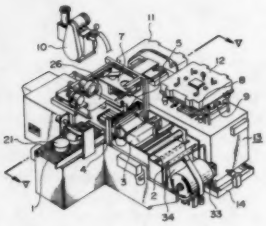
Shingo Okada, Tokyo; Yuji Sawa, and Kuniomi Adachi, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1980, Ser. No. 175,807
Claims priority, application Japan, Aug. 6, 1979, 54-99457
Int. Cl.³ B65B *31/02, 9/02*
U.S. Cl. 53—434 **19 Claims**

3. A vacuum packaging method for solid objects comprising the steps of:

supplying roll means with an object to be packaged;

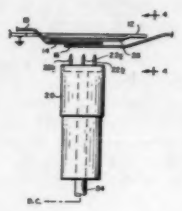
transporting said object along said roll means to a vicinity of a receiver;
effecting relative movement between said receiver and said roll means so that said object is supported solely by said receiver;
drawing the end of a tubular film over an opening core with film drawing means;
surrounding said object together with said receiver;
sealing said end of said film with sealing electrodes;
cutting said tubular film into a predetermined length;
moving suction means into a position above said receiver and applying suction to said film at upper end portions of both the open and sealed ends thereof;
moving said receiver in cooperation with piston means in a manner such that said object is pushed toward said sealed end of said film;
moving said piston means when said receiver has reached a position separated from the open film end so that said object is positioned between said open and sealed film ends and positioned on receiving roll means through said film;
lifting said receiving roll means and said suction means to an upper level to thereby lift said object;



transferring said object with said film to a vacuum chamber of a first vacuum packaging means together with said suction means;
releasing said object in said vacuum chamber;
tensioning both peripheries of said open end of said film opened in the rectangular form so as to prevent the formation of creases during sealing and simultaneously releasing the vacuum condition of said suction means and returning said transferring means to an original position thereof;
lowering said vacuum chamber cover to seal said vacuum chamber;
evacuating said vacuum chamber;
moving said first vacuum packaging means laterally while simultaneously moving a second vacuum packaging means to a predetermined position;
returning said film tensioning means to an original position thereof;
contacting sealing electrodes to thereby seal the open end of said film while simultaneously releasing the vacuum condition in said vacuum chamber; and
opening said vacuum chamber cover while simultaneously moving said first vacuum packaging means laterally to an original position thereof.

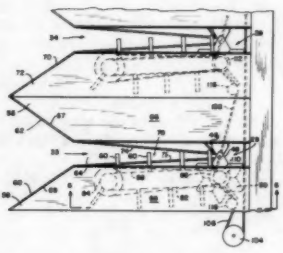
4,419,855
LOW DRAG STATIC SEAMER
Frank G. Shanklin, Hemlock Park Dr., Groton, Mass. 01450
Continuation-in-part of Ser. No. 209,396, Nov. 24, 1980. This application May 20, 1981, Ser. No. 266,080
Int. Cl.³ B65B *9/06, 51/26*
U.S. Cl. 53—450 **27 Claims**

1. Apparatus for statically adhering overlapping portions of sheet film comprising a grounded support having a planar surface across which the overlapping portions of the film are tracked, means associated with the support for generating an electrostatic field through which the overlapping portions of the film pass as they are tracked across said planar surface so as to charge the overlapping portions oppositely and means for



reducing the surface contact of the overlapping portions of the film with the planar surface.

4,419,856
SEED HARVESTING APPARATUS
Clyde L. Taylor, 4146 W. Mineral King, Visalia, Calif. 93277
Continuation of Ser. No. 214,562, Dec. 8, 1980, abandoned, which is a continuation of Ser. No. 85,391, Oct. 16, 1979, abandoned. This application Nov. 25, 1981, Ser. No. 325,060
Int. Cl.³ A01D *91/04*
U.S. Cl. 56—1 **2 Claims**



1. In a method for harvesting sesame stalks standing in rows in a field and having pods thereon carrying sesame seeds therein and in which the pods are of a type which have a tendency to shatter and release their seeds when they are moved or jarred by the use of a sesame seed harvester having a relatively narrow generally V-shaped opening lying in a horizontal plane for receiving sesame seed stalks as the harvester is advanced in the field, simultaneously guiding and supporting the stalks in the relatively narrow V-shaped opening in generally upright positions as they advance in the V-shaped opening by the use of closely spaced stabilizer fingers which extend substantially transversely across the V-shaped opening and lie in a horizontal plane which is in proximity to the horizontal plane of the V-shaped opening and travel at a speed which is approximately equal to the speed of movement of the harvester in the field so that the stabilizer fingers maintain registry with the stalks to minimize any jarring action to the stalks, collecting seeds on both sides of the generally V-shaped opening which accidentally fall from the pods during the time that the stalks are traveling in the V-shaped opening, severing the stalks in a horizontal plane in close proximity to the plane of the V-shaped opening while in the generally V-shaped opening with a minimum of vibration being imparted to the stalks by solely utilizing high speed rotary-type cutoff means and having the fingers engaging the stalks prior to, during and after the stalks are cut off by the rotary-type cutoff means to thereby positively impell the stalks into the rotary-type cutoff means, collecting the stalks after they are severed

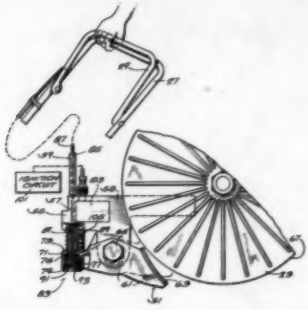
by the rotary-type cutoff means and separating the seeds from the pods carried by the severed stalks.

4,419,857

LAWN MOWER WITH COMBINED ENGINE BRAKE AND IGNITION CONTROL

LaVerne D. Smith, Watuga, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 7, 1981, Ser. No. 291,013
Int. Cl.³ A01D *69/10*; F16D *23/00*
U.S. Cl. 56—11.3 **8 Claims**



1. A rotary lawn mower comprising a housing supported for rotation along the ground, an engine mounted on said housing and including a rotatably mounted crankshaft, a cutter blade located in said housing and fixed to said crankshaft, a braking surface located on said crankshaft and having common rotation therewith, a brake arm supported for movement relative to said engine between a braking position and a non-braking position, said brake arm having therein an aperture and having thereon a brake surface which is engageable with said braking surface when said brake arm is in said braking position, means biasing said brake arm toward said braking position, and means connected to said brake arm for moving said brake arm into said non-braking position against the action of the said brake arm biasing means and including an actuating linkage having a lost motion connection with said brake arm, said actuating linkage comprising a flexible cable including an outer end portion having an end, which outer end portion passes through said aperture, and said actuating linkage further including means preventing withdrawal of said outer end portion of said cable through said aperture, said withdrawal preventing means and said lost motion connection comprising a spring having a first end connected to said end of said cable outer end portion, surrounding said outer end portion of said cable and having a second end bearing against said brake arm.

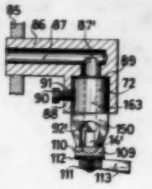
4,419,858

THREAD SPLICING DEVICE

Joachim Rohner; Heinz Zumfeld; Reinhard Mauries, all of Monchen-Gladbach, and Hans-Jürgen Preuhs, Willich, all of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Oct. 27, 1981, Ser. No. 315,411
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040662
Int. Cl.³ B65H *69/06*; D02J *1/08*
U.S. Cl. 57—22 **30 Claims**

1. Thread splicing device, comprising a stationary base body having a first compressed-air canal formed therein, a splicing head being interchangeably connected to said base body, said splicing head having a second compressed-air canal formed therein being in communication with said first compressed-air canal formed in said base body and said splicing head having a splicing chamber formed therein being in communication with said second compressed-air canal formed in said splicing head, said splicing chamber including a selectively coverable longitudinal slot for inserting and joining threads, said slot having a flat slot bottom and a substantially prismoidal cross section being modified in accordance with specifications of the threads



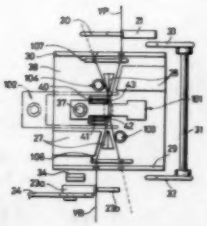
to be spliced, and said splicing head having an air discharge nozzle formed therein at an end of said second compressed-air canal in vicinity of said splicing chamber, said air discharge nozzle having at least one of a smaller open cross section and a different cross-sectional shape than said second compressed-air canal.

4,419,859

SPLICING APPARATUS FOR SPUN YARNS

Hiroshi Mima, Joyo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 19, 1982, Ser. No. 359,947
Claims priority, application Japan, Mar. 24, 1981, 56-43662
Int. Cl.³ D01H *15/00*
U.S. Cl. 57—22 **8 Claims**



1. A splicing apparatus for spun yarns where a yarn end on the package side and a yarn end on the bobbin side are introduced and lapped in a splicing hole formed on a splicing member and a compressed fluid is jetted on the lapped portion of the yarn ends to effect splicing, said splicing apparatus being characterized in that two control members of which positions are adjustable are arranged making a right angle with the axial line of the splicing hole on both the sides of the splicing member so that the lapped portion is put between the two control members and a part of openings of the splicing hole is covered by the control members.

4,419,860

SPLICING HEAD

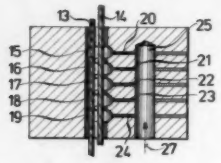
Rolf Becker, Monchen-Gladbach; Josef Bertrams; Franz Grabatsch, both of Wegberg; Gregor Kathke, Viersen; Wolfgang Kiesewetter, Willich; Herbert Knors, Monchen-Gladbach; Jakob Leven, Wegberg; Erich Quack, Monchen-Gladbach; Klaus Rautenberg, Erkelenz; Joachim Rohner, Monchen-Gladbach; Klaus Rosen, Monchen-Gladbach; Günter Wilms, Monchen-Gladbach, and Heinz Zamfeld, Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,114

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1981, 3115234

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—22 **5 Claims**



1. Splicing device for producing a knot-free thread connection by splicing, comprising a splicing head having a longitudinal groove formed therein for the insertion of threads to be joined together, said splicing head having a plurality of cross grooves formed in said longitudinal groove and said splicing head having compressed air supply holes formed therein, at least two of said cross grooves having at least one compressed air supply hole terminating therein.

4,419,861

SPINNING APPARATUS PROVIDED WITH KNOTTING TRUCK

Michiaki Fujiwara, Kameoka, and Makoto Uramoto, Kyoto, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

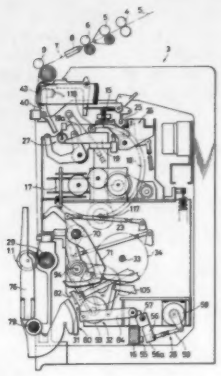
Filed Oct. 16, 1981, Ser. No. 312,123

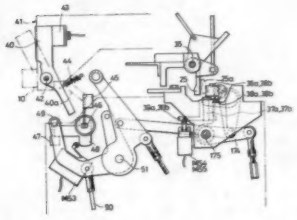
Claims priority, application Japan, Oct. 17, 1980, 55-145971

Int. Cl.³ D01H *15/00, 13/16, 13/22*

U.S. Cl. 57—261 **9 Claims**

1. A spinning apparatus provided with a knotting truck moving along many spinning units, said knotting truck comprising a knotter, a yarn breakage detecting mechanism detecting a yarn breakage indicating piece located on each spinning unit where yarn breakage due to slub occurs and a mechanisn detecting a impediment signal display plate located on each spinning unit where natural yarn breakage occurs, wherein when slub yarn breakage indicating piece alone is detected, the knotting truck stops at the position of the spinning unit and performs a knotting operation and when the impediment signal display plate of the spinning unit where natural yarn breakage occurs is detected, the knotting truck does not stop at the





position of said spinning unit but passes through said spinning unit.

4,419,862

HYDRAULIC MASTER CYLINDERS

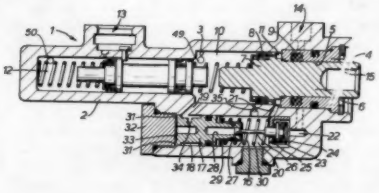
Glyn P. R. Farr, Warwick, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Feb. 27, 1981, Ser. No. 238,755

Claims priority, application United Kingdom, Mar. 17, 1980, 8008948

Int. Cl.³ B60T *11/20*

U.S. Cl. 60—562 **9 Claims**



1. A hydraulic master cylinder comprising: a reservoir for hydraulic fluid; a body defining a primary bore and a secondary bore co-axial with and having a smaller cross-sectional area than the primary bore; a piston rod slidably and sealingly mounted in the secondary bore; a piston connected to the piston rod and slidingly and sealingly mounted in the primary bore, the piston dividing the primary bore into a primary chamber located on the side of the piston remote from the piston rod and a secondary annular chamber located between the piston rod and the wall of the primary bore; an outlet for

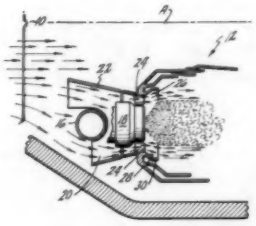
supplying fluid from the primary chamber to hydraulic apparatus; an expander chamber in fluid communication with both the primary chamber and the secondary chamber; a movable expander member located within the expander chamber and dividing the expander chamber into a primary portion which is in fluid communication with the primary chamber and a secondary portion which is in permanent fluid communication with the secondary chamber, the expander member being movable in response to a predetermined pressure differential between the primary and secondary chambers to expand the volume of the primary portion of the expander chamber to receive fluid from the primary chamber and to contract the volume of the secondary portion of the expander chamber and thereby supply fluid to the secondary chamber; means permitting fluid to flow from the reservoir into the secondary chamber until said predetermined pressure differential is reached; and means thereafter preventing fluid flow between the reservoir and the secondary chamber whereby, during brake application, after said predetermined pressure differential is attained said secondary chamber is pressurized and the effective cross-sectional area of said master cylinder is the cross-sectional area of the secondary bore.

4,419,863

FUEL-AIR MIXING APPARATUS

Herman G. Dvorak, Manchester; Robert D. Klapatch, Kensington; Sid Russell, Suffield, and Louis J. Spadaccini, Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 30, 1981, Ser. No. 307,124
Int. Cl.³ F02C *1/00*
U.S. Cl. 60—748 **4 Claims**



3. In combustion apparatus of the gas turbine engine type including a combustion chamber having a plurality of circumferentially spaced fuel nozzles centered in a pattern about the axis of the combustion chamber, the improvement which comprises:

a plurality of air scoops corresponding in number to the number of fuel nozzles and of essentially truncated conical geometry each centered about a corresponding fuel nozzle wherein each of said scoops has an extended arcuate portion in the region nearest said combustion chamber axis for intercepting air flow approaching the chamber along the axis.

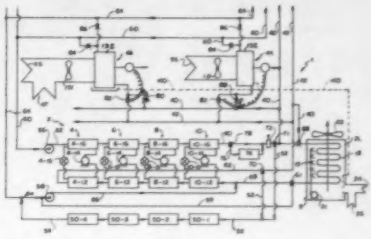
4,419,864

AIR CONDITIONING SYSTEM AND METHOD

Alden I. McFarlan, 691 Dorian Rd., Westfield, N.J. 07090

Filed Sep. 14, 1981, Ser. No. 301,655
Int. Cl.³ F25D *17/02*
U.S. Cl. 62—98 **20 Claims**

1. In a method of air-conditioning a space, the steps of forming a stream of circulating air from a controlled volume of outside air and which may include a controlled volume of recirculated air from said space, passing said stream of circulating air through air-treating means and thereby cooling said stream of circulated air with a refrigeration system which has a fluid cooler in which heat is discharged from said system by a heat-exchange relationship with a stream of exhaust air which is discharged from said space, the volume of said stream of exhaust air being variable with said volume of outside air, and controlling said volume of outside air in said stream of



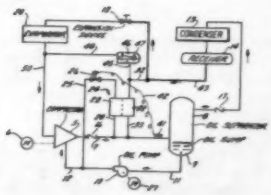
circulating air passing through said air-treating means to that amount required to discharge heat through said fluid cooler at a sufficient rate to maintain the operating conditions within acceptable limits.

4,419,865

OIL COOLING APPARATUS FOR REFRIGERATION SCREW COMPRESSOR

Paul G. Szymaszek, Milwaukee, Wis., assignor to Vilter Manufacturing Company, Milwaukee, Wis.

Filed Dec. 31, 1981, Ser. No. 336,501
Int. Cl.³ F25B *31/00, 43/02*
U.S. Cl. 62—193 **4 Claims**



1. Refrigeration apparatus comprising a screw compressor which is cooled and lubricated by the circulation of oil therethrough and from which a mixture of compressed refrigerant and oil issues to an oil separator through a discharge duct, oil recirculating means comprising an oil pump having an inlet communicated with the oil separator and an outlet from which pressurized oil is conducted to the screw compressor, a receiver to which refrigerant flows from the oil separator through a condenser and in which liquid refrigerant is held for circulation through an evaporator, and delivery means comprising a refrigerant pump having a refrigerant inlet connected with said receiver and an outlet communicated with said discharge duct to deliver thereto a flow of liquid refrigerant that cools said mixture, said apparatus being characterized by:

A. a hydraulic motor drivingly connected with said refrigerant pump and having an inlet for pressurized fluid and an outlet for exhaust fluid;

B. oil duct means for delivering to said inlet of the hydraulic motor a portion of the pressurized oil issuing from the outlet of the oil pump, for energizing the hydraulic motor;

C. other oil duct means communicating the exhaust outlet of the hydraulic motor with said discharge duct; and

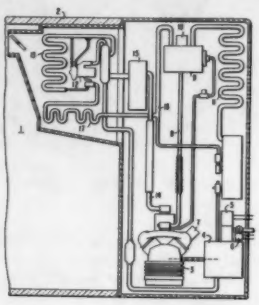
D. a housing which encloses both said refrigerant pump and said hydraulic motor.

4,419,866

TRANSPORT REFRIGERATION SYSTEM CONTROL

Leland L. Howland, Belle Plaine, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Jun. 9, 1982, Ser. No. 386,500
Int. Cl.³ F25B 1/00, 49/00; G05D 23/32
U.S. Cl. 62—228.4 15 Claims



1. In a transport refrigeration system of the type having the capabilities of at least heating and cooling operations, and dual compressor speed operation, and control means responsive to temperatures in the space served by the system for controlling the system in at least four modes of operation in accordance with temperatures in the served space differing from a setpoint temperature range, and in accordance with served space temperature being in first and second temperature bands first above the next above, respectively, the setpoint temperature range, and in accordance with served space temperatures being in third and fourth temperature bands first below and next below, respectively, the setpoint temperature range, the improvement comprising:

said control means includes means for operating the system in either a continuous cycle with said compressor running continuously and, alternatively, in an automatic start-stop cycle in which said compressor is stopped when the served space temperature is in said third temperature band;

said control means further including speed change delay means operative in said continuous cycle operation to delay for a predetermined time an increase in compressor speed from low to high upon a departure in served space temperatures from either the third to the fourth band, or from the first to the second band, coupled with an uninterrupted call by said control means for said high speed, and operative in a start-stop cycle, with said compressor stopped when the served space temperature is in said third temperature band, to effect any start of said compressor, occasioned by a departure of served space temperature from said third band, at said low speed.

4,419,867

DEVICE FOR REGULATING A JOULE-THOMSON EFFECT REFRIGERATOR

Rene D. M. Albagnac, Paris, and Didier Jean-Pierre Silly, Nanterre, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Jul. 2, 1982, Ser. No. 394,772
Claims priority, application France, Jul. 7, 1981, 81 13346
Int. Cl.³ F25B 19/00
U.S. Cl. 62—514 JT 8 Claims

1. A miniaturized device for regulating a Joule-Thomson effect refrigerator comprising:

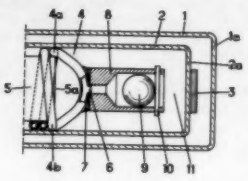
a housing;

inlet duct means in said housing for carrying a refrigerating fluid under pressure;

choke means connected to and communicating with said inlet duct means, said choke means including a tubular member and an inner body in said tubular member and defining a refrigerating fluid passage therebetween,

said tubular member being of a material having a different coefficient of expansion than the material of said inner body;

said housing defining an expansion and refrigeration chamber into which said choke opens, said chamber connecting with a passage formed by said housing and said inlet duct means for providing heat exchange from said expanded fluid in said chamber to said refrigerating fluid under pressure in said duct means;



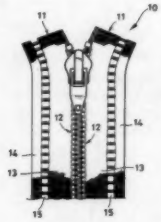
said choke means being regulated to provide a decreasing flow of said refrigerating fluid as the refrigeration temperature drops to an operational temperature in accordance with the differences in said coefficients of expansion of said tubular member and said inner body, and wherein said inner body is designed to act as a shut-off means by expanding radially to occupy said refrigerating fluid passage in the tubular member at said operational refrigeration temperature except for a minimum flow passage defined between said member and said inner body which then enables a minimum flow of the expanded refrigerating fluid.

4,419,868

WARP-KNIT STRINGER TAPE FOR SLIDE FASTENER

Yoshio Matsuda, Nyuzen, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Sep. 15, 1981, Ser. No. 302,608
Claims priority, application Japan, Sep. 10, 1980, 55-132995[U]; Dec. 9, 1980, 55-176402[U]
Int. Cl.³ D04B 21/00
U.S. Cl. 66—195 12 Claims



1. A warp-knit stringer tape for a slide fastener having a pair of rows of coupling elements, comprising:

(a) a first web for supporting along one longitudinal edge thereof one coupling element row of the slide fastener, said first web having a plurality of longitudinal wales of chain stitches;

(b) a second web spaced transversely from said first web with a wale-free region therebetween which is remote from said one longitudinal edge of said first web; and

(c) a connector thread interconnecting said first and second webs across said wale-free region;

(d) a group (hereinafter called first group) of adjacent ones of said wales of said second web which extend along said wale-free region being disposed closely to one another.

4,419,869

APPARATUS FOR TREATING A CLOTH WITH THE USE OF LOW-TEMPERATURE PLASMA

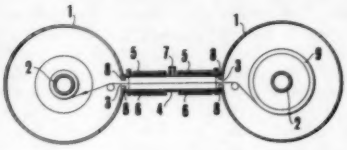
Yoshikazu Sando, Wakayama; Tokuju Goto, Nara; Itsuo Tanaka, Osaka; Hiroshi Ishidoshiro, and Matsuo Minakata, both of Wakayama, all of Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Jan. 18, 1983, Ser. No. 458,986

Claims priority, application Japan, Jan. 26, 1982, 57-10441

Int. Cl.³ D06B *3/10*

U.S. Cl. 68—5 D **2 Claims**



1. An apparatus for treating a cloth with use of low-temperature plasma, comprising a pair of closed cloth taking-up cases provided respectively with a slit-type cloth taking-in and out opening and a cloth taking-up shaft, a cloth passage tube composed of a material permeable to high frequency electric wave, connecting between the two cloth taking-up cases for transporting the cloth therethrough, at least one pair of electrode plates provided at the outer circumference of the cloth passage tube for receiving high frequency electric wave produced by an oscillator, a gas supply pipe connected to the cloth passage tube, and a gas evacuating pipe provided in the vicinity of the cloth taking-in and out opening.

4,419,870

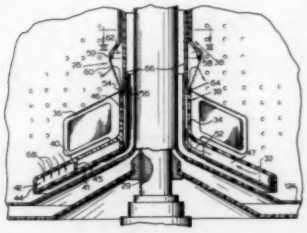
VALVELESS LIQUID PUMPING AGITATOR FOR AUTOMATIC WASHERS

Robert A. Brenner, St. Joseph Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 19, 1981, Ser. No. 294,137

Int. Cl.³ D06F *17/10*

U.S. Cl. 68—18 FA **9 Claims**



8. In an automatic washer of the type having an oscillatory agitator, the improvement of:

pumping means comprising channel means forming a lower horizontal circulatory path and a vertical path through said agitator through which liquid is to be pumped;

venturi means between said circulatory path and said vertical path; and

a radial wall means in said lower circulatory path for diverting said liquid generally upwardly through said vertical path.

4,419,871

FULLING MACHINE FOR TEXTILE MATERIAL IN CONTINUOUS ROPE FORM OR IN HOSE FORM

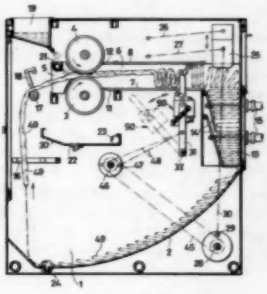
Placido Zonco, and Maurizio Zonco, both of Pray Biellese, Italy, assignors to Zonco Federico & Figlio di Federico, Pietro e Placido Zonco S.n.c., Pray Biellese, Italy

Filed Dec. 1, 1981, Ser. No. 326,369

Claims priority, application Italy, Dec. 15, 1980, 26656 A/80

Int. Cl.³ D06B *3/24*

U.S. Cl. 68—22 R **6 Claims**

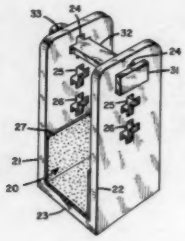


1. In a fulling and washing machine for textile materials in continuous rope or hose form, including a tub having side walls and an at least partially sloping bottom wall, at least one pair of superimposed presser and dragger rollers rotatably mounted above said bottom wall, means to drive each pair of rollers rotatably about their own axes at the same surface speed, said rollers being adapted to receive and cooperatively drive between the rollers of each pair continuous endless bands of fabrics in continuous rope or hose form, the presser roller being held pressed against the dragger roller, a fulling channel downstream of said rollers having an entrance opening, a further channel between each pair of rollers and the entrance opening of the fulling channel, a reciprocating pusher operatively associated with and in said fulling channel to cause the fabric to be fed forward therethrough, drive means to reciprocate said pusher, a basin containing a fulling liquor to be applied to the fabric positioned upstream of said rollers, and a partitioning and guiding frame positioned upstream of said rollers to keep the fabric endless bands spaced apart from each other, the improvement comprising said further channel is an introductory channel into which the fabric is passed from said rollers, a second pusher mounted on said tub so that it is movable in said introductory channel to engage and feed forward said fabric coming from said rollers towards said entrance opening of the fulling channel, means to reciprocate said second pusher synchronously with the reciprocation of the pusher operating in the fulling channel so that it is positioned near the exit end of said introductory channel when the pusher in the fulling channel is in a position wherein it is at least substantially withdrawn from the fulling channel to establish a free communication for said fabric between the introductory channel and the fulling channel.

4,419,872
LOCKING DEVICE FOR SKIERS USE

John W. Plifka, 5412 - 26th Ave. South, Minneapolis, Minn. 55417

Filed Jul. 17, 1981, Ser. No. 284,354
Int. Cl.³ E05B *63/06, 65/00, 73/00;* A45C *13/18;* E21B *19/14;* B25B *5/02*
U.S. Cl. 70—18 4 Claims



1. A ski lock comprising, in combination:

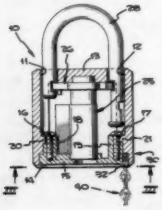
a U-shaped bracket having two generally parallel legs joined and spaced at first ends by a base strap, the free ends of said legs having pairs of aligned cruciform apertures at different spacings from said base strap;

and a removable cross bolt having a generally flat body exhibiting a rectangular cross-section dimensioned to be received in said cruciformed apertures in one of two mutually orthogonal orientations and a head to prevent passages of said bolt entirely through said apertures, the location of said pairs of apertures being such that the spacing between said bolt and said base strap corresponds to at least two different widths for different types of skis and skis with poles.

4,419,873
SECURITY PADLOCK WITH OPTIONAL SUSPENSION CHAIN

Riley M. Sopko, Palos Verdes Estates, Calif., assignor to Phillip L. Alfed, Flintridge, Calif.

Filed Jun. 29, 1981, Ser. No. 278,623
Int. Cl.³ E05B *67/02, 67/22*
U.S. Cl. 70—38 A 6 Claims



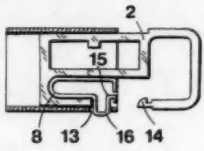
1. In a padlock having a body in which a removable lock cylinder is retained by a removable cylinder guard plate and which has means for fastening the guard plate to the body to retain the cylinder therein, the improvement comprising the provision of:

retainer means for optionally retaining a lock suspension chain to said padlock body wherein said retainer means is operable to retain said chain to said body by the assembly of said guard plate to said padlock body with a portion of said chain trapped between said guard plate and said padlock body.

4,419,874
FASTENER DEVICE

Attilio Brentini, c/o Lansa SA, 5, Ch. de la Gottrause, 1023 Crissier, Vaud, Switzerland

Filed Jul. 29, 1980, Ser. No. 173,298
Claims priority, application Switzerland, Aug. 10, 1979, 7376/79
Int. Cl.³ A44B *15/00*
U.S. Cl. 70—459 3 Claims

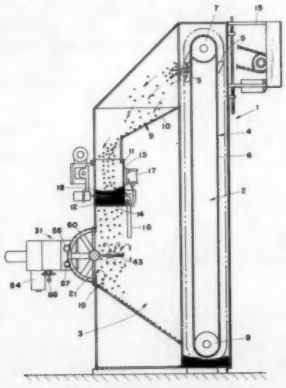


1. A key fastening-device comprising a case (1) and at least one coupling-piece (2) a portion of which is adapted to slide into said case (1), and the outer part of which is arranged to form a key fastening-loop (3), the device further comprising a plane spring (8) arranged in said case (1) for cooperating with the coupling-piece (2) which is also plane, said spring (8) being in the same plane as the coupling-piece (2) and forming a loop (16) passing through an opening (13) of the case (1) to form an operating button (16), said spring (8) presenting in addition a notch (15) for cooperating with a hook (14) provided on the coupling-piece (2) in order to ensure the closed position thereof, so that the operating of the said button (16) ensures the release of the hook (14) from the notch (15) and said spring (8) limits the opening sliding movement of the coupling-piece (2).

4,419,875
ARTICLE MANIPULATOR MECHANISM FOR ACCELERATED SHOT TREATING APPARATUS

Bruce W. DeClark, Walker, and Joseph H. Weber, Grand Rapids, both of Mich., assignors to Progressive Blasting Systems, Inc., Grand Rapids, Mich.

Filed Sep. 10, 1981, Ser. No. 300,947
Int. Cl.³ B24C *1/10*
U.S. Cl. 72—53 16 Claims



1. Mechanism for manipulating articles in the path of a stream of media created by vertical free-falling gravity accelerated media for treating such articles by said media impinging on the same corresponding predetermined portions of surfaces of said articles, said path being directed downwardly and

located within an enclosed housing having an opening closed by an enclosure panel means forming part thereof, comprising:

a plurality of rotatably mounted fixture means projecting from said enclosure panel into said housing toward the said path of said accelerated media and each having article holder means at one end for holding an article to be treated in said path; said fixture means being mounted on said enclosure panel means, and said holder means extending inwardly thereof,

common driver means operatively connected to the other ends of each of said fixture means on the outer side of said enclosure panel means for rotating said fixture and holder means inside said housing, said driver means including a motor means operatively connected to each of said fixture means so as to rotate all of said fixtures and holder means in unison whereby predetermined surfaces of the articles held by said holder means are exposed in a uniform manner to said falling stream of media so that each article is subjected to the same peening intensity.

4,419,876

PRESSURE CONTROL APPARATUS FOR HYDROMECHANICAL DRAWING

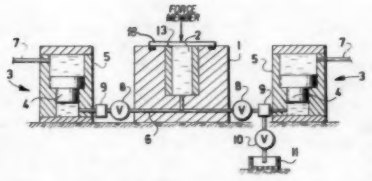
Jindrich Spacek; Vaclav Smrcek; Karel Voda, all of Brno; Jiri Kosek, Zdar n/Saz; Jan Hrdina, Zdar n/Saz, and Vaclav Penaz, Zdar n/Saz, all of Czechoslovakia, assignors to Tovarny strojirenske techniky, koncern, Prague, Czechoslovakia

Filed Dec. 12, 1980, Ser. No. 215,915

Claims priority, application Czechoslovakia, Dec. 12, 1979, 8664-79

Int. Cl.³ B21D *39/08*

U.S. Cl. 72—57 **5 Claims**



1. In a hydromechanical drawing apparatus for the deep drawing of sheet metal in hydraulic presses having a pressure chamber in which the pressure chamber constitutes the drawing die, the improved device for the control of the pressure in the pressure chamber comprising a control system with a plurality of two-diameter piston transformers connected at the small diameter side to the pressure chamber and at the large diameter side to a fluid pressure supply line, wherein the said transformers' outputs are each valved to the pressure chamber, at least one of these outputs being closable independently of the others, and that furthermore the forming pressure chamber contains at least one interchangeable liner member to provide optional pressure chamber valumes, said transformers being selectively utilized dependend upon the liner selected.

4,419,877

METHOD OF MANUFACTURING A CYLINDRICAL SLEEVE PROVIDED WITH INTERNAL GROOVES, AND TOOL FOR CARRYING OUT THIS METHOD

Carmel Alfano, Saint Brice sous Foret, France, assignor to Societe Anonyme DBA, Paris, France

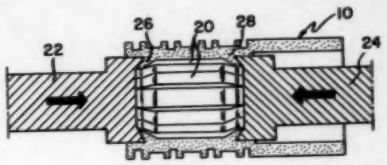
Division of Ser. No. 109,708, Jan. 4, 1980, abandoned. This application May 21, 1982, Ser. No. 380,856

Claims priority, application France, Jan. 16, 1979, 79 00949

Int. Cl.³ B21K *21/12*

U.S. Cl. 72—325 **2 Claims**

1. A method for manufacturing a cylindrical sleeve provided with internal grooves extending axially between a pair of shoulders, the shoulders extending radially from a large diameter to a small diameter, the grooves defining a base diameter smaller than said large diameter and larger than said small diameter, said method comprising the steps of abutting a punch against at least one of said shoulders in order to deform said one shoulder, said punch abutting against said shoulder at a location between said large diameter and said base diameter, said one shoulder deformation causing the material of said one shoulder to extend radially inwardly inside said small diameter to substantially close said grooves adjacent said deformed one



shoulder, said punch being formed with a shallow central impression whose flat base is connected to the peripheral edge of the punch by an element of concave surface with a relatively large radius of curvature, said abutting of said punch against said one shoulder deforming said one shoulder along said concave surface and along said flat base in order to define a continuous annular bead closing one end of said grooves, and machining said continuous annular bead to remove excess material for said deformed one shoulder radially inside said small diameter.

4,419,878

HYDRAULIC DROP FORGING PRESS OF ABOVE-CONSTRUCTION WITH PRESTRESSED PRESS FRAME

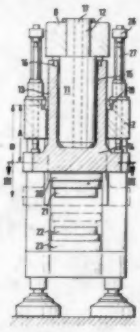
Hermann Füsser, Haan, Fed. Rep. of Germany, assignor to SMS Schloemann Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 21, 1981, Ser. No. 295,082

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1980, 3032355

Int. Cl.³ B21J *9/02*

U.S. Cl. 72—455 **7 Claims**



1. An above-floor drop-forging press comprising a lower crosshead, an upper crosshead, a guide crosshead between the lower and upper crossheads, columns interconnecting said lower and guide crossheads, columns interconnecting said guide and upper crossheads, compression abutments disposed between respective mutually opposed surfaces of said lower and guide crossheads and said guide and upper crossheads, prestressing means to respectively prestress said columns and said abutments by compressing said abutments between the

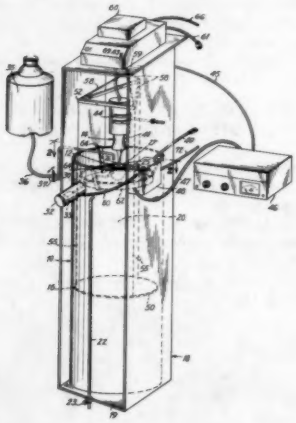
crossheads so that said crossheads, abutments and columns form a prestressed press frame, a downwardly facing piston mounted on the upper crosshead, a vertically movable hydraulic cylinder enclosing said piston in operable engagement therewith, said cylinder having a lower end region adapted to carry an upper forging die, movable lower guide means operably arranged on said cylinder, lower end region for guiding the cylinder lower end region relative to said columns interconnecting said lower and guide crossheads, and upper guide means guiding said cylinder in the guide crosshead comprising a stationary guide in the guide crosshead in guiding engagement with said cylinder.

4,419,879

PARTICLE MEASURING APPARATUS

Darrell C. Bush, Colleyville, and Ralph E. Jenkins, Irving, both of Tex., assignors to Core Laboratories, Inc., Dallas, Tex.

Filed Oct. 16, 1981, Ser. No. 312,107
Int. Cl.³ G01N *15/02, 15/04*
U.S. Cl. 73—432 PS **19 Claims**



1. Sedimentation-type particle size measuring apparatus for measuring the size of solid particles falling in a fluid of known viscosity, the apparatus comprising, in combination:

a sedimentation container for the known-viscosity fluid;

a cup-shaped particle dispenser initially containing a sample of solid particles and disposed above the fluid in the sedimentation container;

swingable support means supporting the particle dispenser for swinging movement and selectively actuable for swinging said particle dispenser so that the latter discharges said solid particles immediately above the surface of the fluid in the sedimentation container, thereby rapidly transferring said solid particles from said dispenser to said sedimentation container;

means including a particle receiving member supported in the fluid in the sedimentation container for detecting the landing thereon of solid particles transferred from said dispenser; and

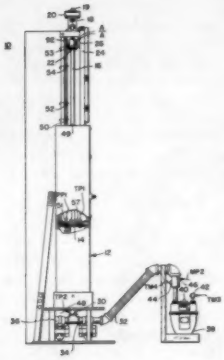
means responsive to the detection of the landing of said solid particles onto the particle receiving member for determining the size of the received particles.

4,419,880

APPARATUS FOR CALIBRATING FLUID FLOW METERS UTILIZING DIGITAL TECHNIQUES

Peter J. Hanowich, McKees Rocks, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1980, Ser. No. 134,994
Int. Cl.³ G01F *25/00*
U.S. Cl. 73—3 **65 Claims**



1. Apparatus for calibrating a fluid flow meter under test, said apparatus comprising:

(a) means for directing a known volume of fluid through the meter under test, said directing means comprising a housing having a start-test position fixedly disposed with respect thereto, and means for displacing the fluid between said housing and the meter under test said housing being coupled to the fluid flow meter under test to permit the fluid to be directed through the fluid meter by said displacing means;

(b) first measuring means coupled to the fluid flow meter under test to provide a first indication of fluid flow as measured by the fluid meter;

(c) second measuring means coupled to said directing means for providing a second, calibrated indication of the fluid drawn by said directing means through said meter; and

(d) control means including means responsive to the movement of said displacement means with respect to said defined start-test position for enabling the accumulation of the first and second indications of the fluid flow, and means for terminating the accumulations of the first and second indications upon the occurrence of the accumulation by said first measuring means of a predetermined quantity of the first indication, whereby the known volume of fluid is defined with respect to said start-test position for each meter test and the accumulated value of the second indication provides a calibrated, precise manifestation of the fluid flow through the meter.

4,419,881

HYDRODYNAMIC PRESSURIZING APPARATUS

Joseph A. Gentiluomo, Schenectady, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 4, 1982, Ser. No. 374,830
Int. Cl.³ G01N *3/36;* G01M *3/02*
U.S. Cl. 73—37 **10 Claims**

1. A Hydrodynamic Pressurizing Apparatus comprising:

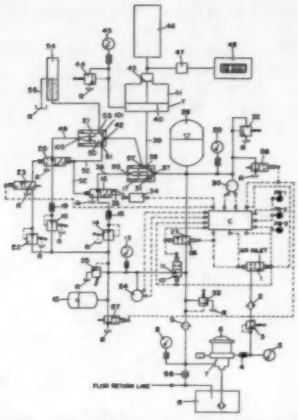
(a) a loading valve having a cushion port, an inlet port, and a first and second exit port,

(b) an accumulator having a discharge port mounted directly to said inlet port of said loading valve;

(c) an intensifier having a low pressure port mounted di-

rectly to said first exit port of said loading valve; said intensifier having a high pressure outlet port;

(d) an unloading valve having an inlet port mounted directly to said second exit port of said loading valve; said unloading valve having an exit port,



(e) a pressure vessel having a bottom inlet and mounted directly to said high pressure outlet port of said intensifier;

(f) and auxiliary fluid power and electric control equipment functionally associated with said loading valve, said accumulator, said intensifier, said unloading valve, and said pressure vessel, to provide proper system operation.

4,419,882

LEAKAGE DETECTION METHOD USING HELIUM

Hiroshi Ishii; Kohji Seki, both of Tokyo; Hiroshi Morishita, Kawasaki, and Toshiaki Yamazaki, Tokyo, all of Japan, assignors to Nihonsanso Kabushiki Kaisha, Japan

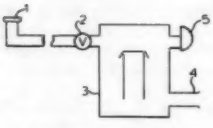
PCT No. PCT/JP81/00048, § 371 Date Nov. 10, 1981, § 102(e) Date Nov. 10, 1981, PCT Pub. No. WO81/02631, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 6, 1981, Ser. No. 325,435

Claims priority, application Japan, Mar. 10, 1980, 55-29946

Int. Cl.³ G01M *3/20*

U.S. Cl. 73—40.7 **10 Claims**



1. A method of detecting a leakage in a system by the use of helium gas, comprising the steps of:

supplying the helium gas to the system

first drawing from the system sample gases at a low vacuum pressure which is created by a first vacuum pump, the sample gases including the supplied helium gas when the leakage exists in the system;

throttling the flow of the drawn sample gases;

increasing helium component in part of the throttled sample gases;

detecting the increased helium component in the part of the sample gases; and

exhausting the helium component increased sample gases so that the detecting step is made with the helium component increased sample gases being placed at a high vacuum pressure of at least 10^4 Torr which is created by means of a second vacuum pump.

4,419,883

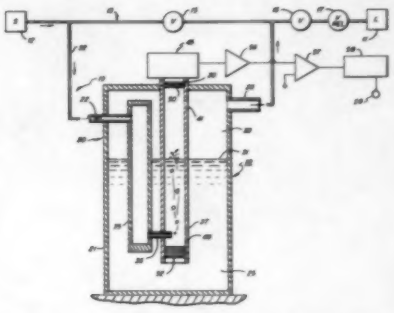
LEAK DETECTOR

N. E. Gelston, II, 7 Orchard Rd., Skaneateles, N.Y. 13152

Filed Mar. 1, 1982, Ser. No. 353,609

Int. Cl.³ G01M *3/10*

U.S. Cl. 73—49.3 **16 Claims**



1. A method of detecting leaks in a hermetically sealed unit that includes the steps of

providing a source of gas at a predetermined test pressure that is above ambient pressure,

connecting the source to the unit by means of a first flow circuit whereby the internal pressure of the unit is equal to the test pressure,

rerouting gas from the source to the unit through a second flow circuit containing a bubble chamber whereby, in the event of a leak, a path of bubbles is established in a liquid,

at least partially immersing a waveguide connected to a radar unit in said liquid,

transmitting radar signals along the waveguide at the bubble path in said chamber,

detecting changes in the transmitted signals produced by the movement of bubbles in the liquid that are returned along said waveguide, and

producing an output signal in response to the detection of bubbles in the liquid.

4,419,884

TEST HEAD FOR COMPRESSED GAS CYLINDERS

Carl A. Grenci, deceased, late of Yorba Linda, Calif., and by William C. Jordan, executor, Laguna Hills, Calif., assignors to La Nora J. Grenci, Yorba Linda, Calif.

Filed Jun. 14, 1982, Ser. No. 388,079

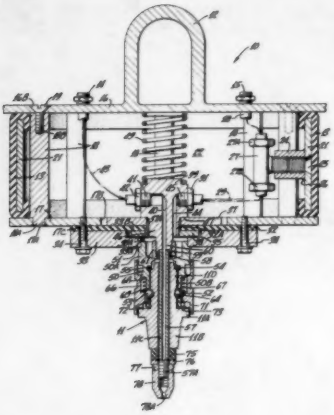
Int. Cl.³ G01M *3/02*

U.S. Cl. 73—49.8 **11 Claims**

1. In a test head for sealing the threaded neck of a compressed gas cylinder or the like of the type comprising a rigid support member, a spud adapted for threaded engagement with said neck, said spud having an axial opening extending therethrough, means defining a chamber in said test head, said means comprising a movable diaphragm, the perimeter of which is connected to said support member, and a hollow, cylindrical coupling member rigidly connected to said support member, an elongate member extending through said axial opening in sid spud, means for connecting one end of said elongate member to said diaphragm, an expansible grommet surrounding the other end of said elongate member, and a fitting fixedly attached to said other end of said elongate member, said grommet being positioned between said spud and said fitting whereby longitudinal motion of said elongate member

imparted by movement of said diaphragm causes said grommet to be compressed between said fitting and said spud, the improvement comprising quick-disconnect means for said speed comprising:

a coupling sleeve surrounding said coupling member and mounted for movement between first and second positions; and



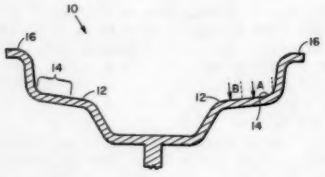
means operatively associated with said coupling sleeve for locking said spud in a desired axial position relative to said elongate member in said first position of said coupling sleeve and for permitting slidable movement of said spud relative to said elongate member in said second position of said coupling sleeve whereby said spud may be detached from said test head upon movement of said coupling sleeve from said first to said second position.

4,419,885

METHOD OF VERIFYING THE STRESS ROLLING OF A METALLIC RIM

Roy C. Holmstrom, Lake Orion, and John V. Liggett, Plymouth, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 18, 1982, Ser. No. 379,397
Int. Cl.³ G01N *3/40*
U.S. Cl. 73—78 **3 Claims**



1. A method of verifying that a surface of a portion of a metallic rim has been stress rolled, said metallic rim including a reference surface that has not been stress rolled, said method comprising:

taking a first hardness reading of said surface;

taking a second hardness reading of said reference surface; and

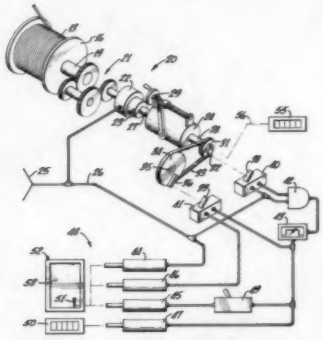
comparing said first hardness reading to said second hardness reading, said first hardness reading being significantly higher than said second hardness reading when said surface of said portion of said metallic rim has been stress rolled and not significantly higher than said second hardness reading if said surface has not been stress rolled.

4,419,886

RATE OF PENETRATION SENSOR FOR OIL DRILLING RIGS

Leslie D. Peterson, Santa Ana, Calif., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Dec. 18, 1981, Ser. No. 332,243
Int. Cl.³ E21B *45/00*
U.S. Cl. 73—151.5 **22 Claims**



1. Apparatus for determining the amount of wire paid out from a drum comprising:

means for providing a first output having a fixed relationship to the rotation of said drum;

adjustable input-to-output-ratio drive means responsive to said first output for providing a second output having an adjustable relationship to the rotation of said drum, said drive means being adjustable to provide an average of the correct rate of wire paid out from said drum relative to rotary motion of said drum; and

means responsive to said second output for generating a third output approximately indicative of a given amount of wire paid out from said drum.

4,419,887

DISTINGUISHING TRUE BASEMENT FROM DIKES AND SILLS ENCOUNTERED IN DRILLING OF A BOREHOLE THROUGH THE EARTH

Luke S. Gournay, Rockwall, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 13, 1982, Ser. No. 377,894
Int. Cl.³ E21B *49/00*
U.S. Cl. 73—152 **5 Claims**

1. In the drilling of a borehole in the earth, the method of determining whether a rock formation encountered by said drilling is true basement or a dense intrusion comprising:

traversing said borehole with a density logging tool in a depth interval extending above the point at which drilling encountered said rock formation;

measuring the density of the formation surrounding the borehole as a function of depth over said depth interval;

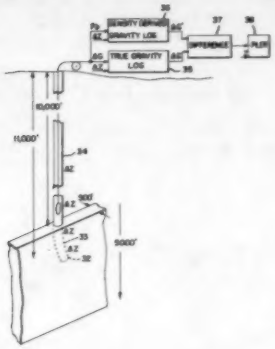
traversing said borehole with a gravimetric logging tool;

measuring true gravity as a function of depth over said depth interval;

converting said density and said true gravity to a common measurement;

determining the difference between said density and said

true gravity in said common measurement over said depth interval; and



plotting a log of said difference on which true basement is distinguished from intrusive sills and dikes.

4,419,888

HUMIDITY MEASURING METHOD

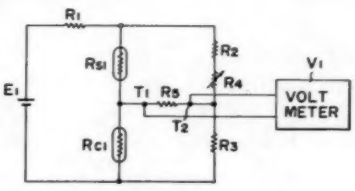
Kenzo Kitamura, Tokyo; Tetsuo Miura, Omiya; Satoshi Ookubo, Hasuda, and Hideyuki Nagata, Urawa, all of Japan, assignors to Kabushikikaisha Shibaura Denshi Seisakusho, Japan

Filed May 9, 1980, Ser. No. 148,465

Claims priority, application Japan, Jun. 14, 1979, 54-74858; Jun. 14, 1979, 54-81092[U]; Jun. 14, 1979, 54-81093[U]

Int. Cl.³ G01W *1/02, 25/18*

U.S. Cl. 73—336.5 **5 Claims**



1. A hygrometer comprising:

a heat sensitive element having a temperature-resistance characteristic and held in a manner to be exposable to the open air;

a temperature compensating element having substantially the same temperature-resistance characteristic as the heat sensitive element and held in a completely dry state;

two resistors;

the heat sensitive element, the temperature compensating element and two resistors forming a bridge circuit;

a power source for supplying a current to the heat sensitive element and the temperature compensating element to heat them up to a temperature above the open air temperature; and

a temperature compensating amplifier for amplifying an unbalanced output voltage from the bridge circuit, caused by a change in the resistance value of the heat sensitive element corresponding to the amount of water vapor contained in the open air, in such a manner that the amplification factor may vary with the open air temperature and the output corresponding to the relative humidity of the open air may have nothing to do with the open air temperature; and

voltage measuring means supplied with the output voltage from the temperature compensating amplifier to indicate the relative humidity.

4,419,889

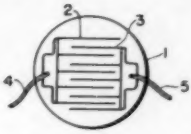
MOISTURE SENSITIVE DEVICE

Katsutoshi Muto; Takao Sawada, and Yoshiharu Komine, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1981, Ser. No. 248,374

Int. Cl.³ G01W *1/00*

U.S. Cl. 73—336.5 **15 Claims**



1. A moisture sensitive device comprising a moisture sensitive element including a material comprising $M_{10}(PO_4)_6(OH)_2$, wherein M is at least one member selected from the group consisting of Sr, Ca and Ba, at least two electrodes formed on said moisture sensitive element, with said electrodes being separated by said element, and to each of said electrodes is connected at least one electrical lead.

4,419,890

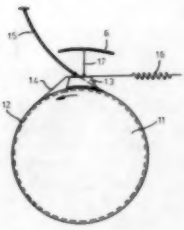
BICYCLE ERGOMETER

Esko Kotamäki, Turku, Finland, assignor to Tunturipyörä Oy, Turku, Finland

Filed Mar. 16, 1981, Ser. No. 244,301

Int. Cl.³ G01L *5/22*

U.S. Cl. 73—379 **1 Claim**



1. A bicycle ergometer comprising:

a flywheel formed with a peripheral groove;

a brake band extending around the periphery of said flywheel;

a weight riding on the periphery of said flywheel and guided in said groove, said brake band being secured to said weight;

a tensioning element connected to said brake band for tightening same against said periphery of said flywheel;

a spring having an end connected to said weight and adapted to resist entrainment thereof with said flywheel; and

an indicator connected to said weight for displaying displacement thereof against the force of said spring.

4,419,891

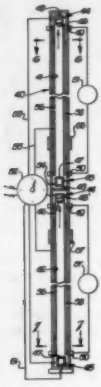
SUPPORT GRAVITY MEASUREMENT INSTRUMENT

Alva L. Browning, 1012 N. Lupine, Lompoc, Calif. 93436

Continuation-in-part of Ser. No. 935,386, Oct. 13, 1978, abandoned, Ser. No. 757,754, Jan. 7, 1977, abandoned, Ser. No. 646,402, Jan. 2, 1976, abandoned, Ser. No. 510,559, Sep. 30, 1974, abandoned, Ser. No. 399,099, Sep. 20, 1973, abandoned, Ser. No. 404,294, Oct. 9, 1973, Pat. No. 3,965,755, and Ser. No. 41,845, Jun. 1, 1970, abandoned. This application Dec. 18, 1981, Ser. No. 332,252

Int. Cl.³ G01V 7/14

U.S. Cl. 73—382 G 51 Claims



1. A sensing mass field support gravity measurement instrument comprising an elongated measuring unit adapted to be mounted in substantial radial alignment with respect to the earth's center of gravity,

said unit comprising a tube having an elongated sealed chamber,

upper and lower support assemblies for said mass,

one of said assemblies being mounted in the tube at the upper end of the chamber

and the other of said assemblies being mounted in the tube at the lower end of the chamber,

a single sensing mass adapted to serve both support assemblies, and means including said tube forming a free fall passageway between said assemblies for said sensing mass,

each support assembly comprising a plurality of pairs of energizable support members for said sensing mass aligned on axes perpendicular with respect to each other, and means operably connected to each pair of support assemblies adapted to alternately energize and de-energize said support assemblies in opposite sequence,

apertures in the respective support assemblies on mutually facing sides spaced from each other by said free fall passageway,

a timer having a sequence of operation adapted to cyclically energize and de-energize said support assemblies in opposite sequence,

a sensing mass return pulse means connected to said timer having a cycle of operation in a sequence adapted to periodically return the sensing mass from one support assembly to the other support assembly,

and a clock device for measuring the time consumed in the free fall of the sensing mass from the upper support assembly to the lower support assembly,

said clock device comprising a start trigger for the upper support assembly responsive to the sensing mass upon emergence from the respective aperture and a stop trigger for the lower support assembly responsive to the sensing mass prior to entry into the lower support assembly.

4,419,892

METHOD FOR DETERMINATION OF INTERNAL PIPELINE OR TUBING CORROSION

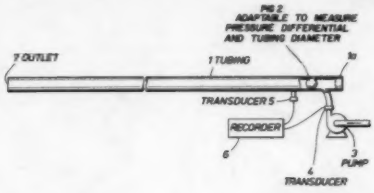
Alvin D. Goolsby, Houston, Tex., and Ignatius A. M. Hesselman, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 17, 1981, Ser. No. 284,280

Claims priority, application United Kingdom, Sep. 3, 1980, 8028446

Int. Cl.³ G01M 19/00; G01N 33/00, 17/00

U.S. Cl. 73—432 R 4 Claims



1. A method for determining the variations with time of the internal condition of a pipeline or tubing, comprising propelling a pig, which is sealed against the pipeline or tubing wall, through the pipeline by means of a constant flowing driving fluid; continuously measuring and recording the pressure of the driving fluid during passage of the pig through the pipeline or tubing; deriving from the recorded pressure signals a plurality of quantities representative of the pressure variations in successive intervals of the pipeline or tubing, each interval having a predetermined length to cover the total length of the pipeline or tubing to be inspected; comparing the values of the quantities thus obtained with previously determined reference data of these quantities for the pipeline or tubing being inspected; and deriving from said comparison information as to the internal diameter variations of the pipeline or tubing being inspected.

4,419,893

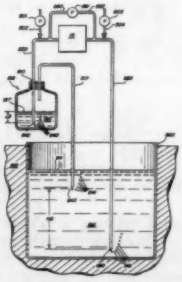
METHOD FOR DETERMINING SPECIFIC GRAVITY OF A LIQUID

Lloyd A. Baillie, Homewood, and George A. Uhl, Crete, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 255,915, Apr. 20, 1981, abandoned, which is a division of Ser. No. 99,348, Dec. 3, 1979, Pat. No. 4,299,116. This application Jul. 20, 1982, Ser. No. 399,942

Int. Cl.³ G01N 9/26

U.S. Cl. 73—439 2 Claims



1. A process for measuring the average specific gravity of a first liquid within a tank by means of a photocell manometer having a first sensor and a second sensor, said process comprising:

introducing a first vapor purge stream into said second sensor which has an orifice thereof located below a surface of a reference liquid at a rate at least sufficient to keep said reference liquid from entering said orifice of said second sensor,

introducing a purge stream of said first vapor into a hollow column at a rate at least sufficient to maintain said column which is within said first liquid uniformly and completely filled with said first vapor, wherein said column has two ends consisting of a first end and a second end, wherein the first end is above a surface level defined by said reference liquid, and the second end terminates near a bottom of said tank, at a distance spaced from said bottom at least sufficient to permit said first vapor to exit from said second end,

introducing a second vapor purge stream into said first sensor which has an orifice thereof located below said surface level defined by said first liquid at a rate at least sufficient to keep said first liquid from entering said orifice of said first sensor, wherein said orifices of said first and second sensors are at the same height relative to one another, and

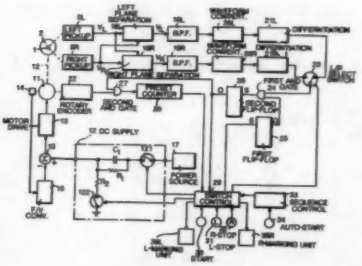
measuring a difference in pressure transmitted by said first sensor relative to a pressure transmitted by said second sensor; whereby a process for measuring the relative density of said first liquid as compared to said reference liquid can be achieved.

4,419,894

DETECTION OF ANGULAR LOCATION OF UNBALANCE OF A ROTOR AND POSITIONING OF THE LOCATION TO A PREDETERMINED ANGULAR POSITION

Sigeru Matumoto, Musashino, Japan, assignor to Kokusai Company, Ltd., Japan

Filed Aug. 3, 1981, Ser. No. 289,434
Claims priority, application Japan, Aug. 2, 1980, 55-106598
Int. Cl.³ G01M *1/22, 1/26*
U.S. Cl. 73—462 **16 Claims**



1. A system for automatically detecting an angular location of unbalance of a rotor piece and simultaneously positioning the location to a predetermined stop angular position, which comprises;

two bearing means for rotatably supporting the axially opposite ends of the rotor piece to be tested;

drive motor means having motor controlling means;

means for transmitting rotation of said drive motor means to the test rotor piece supported by said bearing means;

pickup means coupled with at least one of said bearing means for picking up once-per-revolution vibratory motion of said bearing means or forces on said bearing means due to dynamic unbalance of the test rotor piece as a vibration signal;

pulse forming circuit means for forming phase indicating pulse signals from said vibration signal, said phase indicating pulse signals being presented at each of a plurality of predetermined phase intervals of said vibration signal and indicating the unbalance location passing a reference angular position;

pulse generating means for generating angular pulse signals, each of said angular pulse signals indicating rotation of the test rotor piece over a predetermined unit angular extent;

preset counter means in which a number of $(2n\pi+\alpha)/a$ can be preset, where n is a predetermined rotation speed of the test rotor piece, α being an angle between said predetermined stop angular position and said reference angular extent;

means for generating a motor speed reduction signal which is fed to said motor drive controlling means to reduce rotational speed of said drive motor means;

means coupled with said pulse forming circuit means and said motor speed reduction signal generating means and said pulse generating means for transmitting said angular pulse signals to said preset counter means after receiving one of said phase indicating pulse signals following said motor speed reduction signals; and

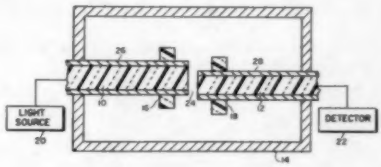
said preset counter means providing a signal to stop said drive motor means at a time when said angular pulse signals are counted up to the preset number, whereby said drive motor means is immediately stopped so that the unbalance location of the test rotor piece is positioned to said predetermined stop angular position.

4,419,895

CANTILEVERED-BEAM, FIBER-OPTIC ANGULAR ACCELEROMETER

Harrison W. Fuller, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Jan. 25, 1982, Ser. No. 342,254
Int. Cl.³ G01P *15/08*
U.S. Cl. 73—517 A **8 Claims**



1. An angular accelerometer, comprising:

a first optical fiber arranged as a cantilevered-beam;

a second optical fiber arranged as a cantilevered-beam spaced and offset from such first optical fiber such that optical coupling between said first and second optical fibers varies proportionately to angular accelerations about an axis perpendicular to the fiber axes and perpendicular to the direction of offset; and

means for mass loading each of said first and second optical fibers with a mass loading member which is non-responsive to magnetic fields.

4,419,896

FORCE OR VIBRATION INDICATING DEVICE UTILIZING MICROWAVE RESONANCE FERRAMIC GYRATORS

Carl O. Olson, Jr., 8705 Little River Tpke., Annandale, Va. 22003

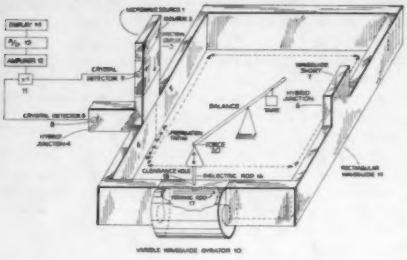
Filed Aug. 27, 1981, Ser. No. 296,852
Int. Cl.³ G01N *29/00*; G01L *1/00*
U.S. Cl. 73—652 **1 Claim**

1. A device for measuring an applied weight, force or vibration comprising:

(a) a microwave energy source capable of transmitting energy,

(b) a microwave bridge waveguide connection containing in

one arm a variable phase shift gyrator with a movable ferramic rod or slab, said movable ferramic rod or slab is connected by a free moving small dielectric rod to a means for receiving a weight, force or vibration source, the dielectric rod passes thru a small clearance hole in the side



of the waveguide gyrator, whereby movement of the ferramic rod or slab in the gyrator produces an accompanying microwave phase change and bridge unbalance which is detected as a measure of the applied weight, force or vibration.

4,419,897

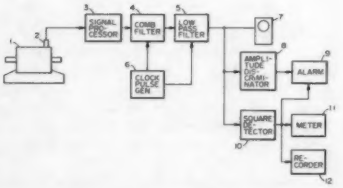
APPARATUS FOR HARMONIC OSCILLATION ANALYSIS

Katsutoshi Matsuoka, Chigasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1980, Ser. No. 147,050

Int. Cl.³ G01H *1/00*

U.S. Cl. 73—660 **5 Claims**



1. Apparatus for harmonic oscillation analysis comprising:

a detector for taking up, as electrical oscillation, such mechanical oscillation generated during the operation of a rotary machine system;

a comb filter for extracting from the detector's output signal having a composite periodic oscillation wave form only a fundamental wave component having a determined fundamental frequency (fo) and high harmonic wave component thereof;

a clock pulse generator for generating clock pulse to drive said comb filter by the clock pulse having the fundamental frequency fo; and

discriminating means for evaluating abnormality of said rotary machine system depending upon the particular signal components extracted by said comb filter.

4,419,898

METHOD AND APPARATUS FOR DETERMINING THE MASS FLOW OF A FLUID

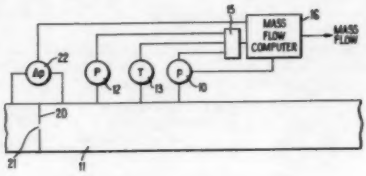
Klaus J. Zanker, Four Marks, near Alton, and Gerald Anderson, New Arlesford, both of England, assignors to Sarasota Automation Limited, Winchester, England

Filed Oct. 15, 1981, Ser. No. 311,523

Claims priority, application United Kingdom, Oct. 17, 1980, 8033540

Int. Cl.³ G01F *1/86*

U.S. Cl. 73—861.02 **5 Claims**



1. A method of determining the mass flow of a fluid comprising measuring, at each of a plurality of different regions in the fluid, a plurality of parameters comprising the pressure P, the temperature T and the density ρ of the fluid, determining the specific gravity G of the fluid from said parameters, and using the measured density together with a further parameter which varies with the volumetric flow to evaluate the mass flow of the fluid only if the so-determined values of G at said regions are within a given range of values.

4,419,899

ELECTROMAGNETIC FLOW METER

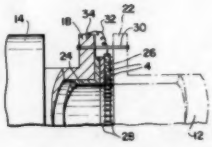
Ichiro Wada, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 22, 1982, Ser. No. 360,420

Claims priority, application Japan, Apr. 30, 1981, 56-63510[U]

Int. Cl.³ G01F *1/58*

U.S. Cl. 73—861.12 **17 Claims**



1. An electromagnetic flow meter for measuring the flow of a liquid flowing through a pipe, comprising:

an electromagnetic flow meter body having at least one connecting end for connecting the body to one end of the pipe; and

a grounding device adapted to be fastened between the connecting end of said body and the end of the pipe, said grounding device comprising (a) an annular frame of an insulating material having an inner periphery defining a central opening and an outer periphery and (b) a grounding wire disposed on said annular frame at least at said inner periphery to be exposed to said central opening of said annular frame.

4,419,900

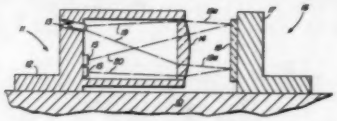
MACHINE HEALTH MONITORING SYSTEM

David R. Scott, Lancaster, Calif., and Thomas S. Rhoades, Colorado Springs, Colo., assignors to Machine Monitoring Research & Development Program, Ariz.

Division of Ser. No. 265,031, May 18, 1981, which is a continuation of Ser. No. 86,772, Oct. 22, 1979, Pat. No. 4,287,511. This application Nov. 13, 1981, Ser. No. 320,873

Int. Cl.³ G01L 5/00

U.S. Cl. 73—862.06 1 Claim



1. A system for collecting and interpreting data reflecting the effect of at least a selected one of a plurality of forces acting on a machine tool for forming and/or bending metals, said system comprising, in combination:

(a) at least one structural moment detector carried by said machine tool assembly for generating output signals in response to said plurality of forces acting on said machine tool assembly;

(b) means for processing said output signals to modify the information content thereof, including rejecting components of said signals which reflect the effects of extraneous forces other than said selected one; and

(c) means for manipulating said processed signals to provide secondary signals responsive to the condition of said machine tool assembly as a result of the application of said selected force.

4,419,901

DEVICE FOR MEASURING THE AXIAL FORCE IN A SHAFT JOURNALLED BY ROLLER BEARINGS

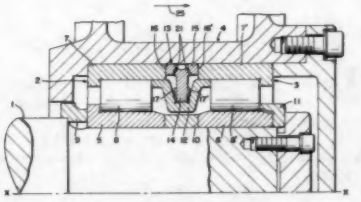
Helmut Ruppert, Kassel, and Dietmar Frase, Dittelbrunn, both of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Essen and SKF Kugellagerfabriken GmbH, Schweinfurt, both of, Fed. Rep. of Germany

Filed Mar. 23, 1982, Ser. No. 361,526

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111434

Int. Cl.³ G01L 5/12

U.S. Cl. 73—862.49 10 Claims



1. A device for measuring the axial force in a shaft which has a shaft shoulder and is journalled by means of two roller bearings arranged side by side in a housing having a bearing cover, with a first one of said roller bearings being located in the vicinity of said bearing cover, and a second one of said roller bearings being located remote from said bearing cover, said device further comprised in that:

said second roller bearing has an inner ring which engages said shaft shoulder, and has an outer ring;

an angle ring is arranged on said shaft in the vicinity of said bearing cover;

said first roller bearing has a flangeless inner ring, and has an outer ring; each of said roller bearings being provided with a row of roller bodies respectively arranged between said outer and inner rings of the roller bearing with which it is associated, with the roller bodies of said row of roller bodies of said first roller bearing being supported on said inner ring of said first roller bearing in such a way that those end faces of said roller bodies of said last-mentioned row of roller bodies which face said bearing cover bear against said angle ring;

a flanged ring, which transfers force and is movable in the direction of force when force is applied, is provided in such a way that those ends of said roller bodies of said rows of roller bodies which face one another are supported on said flanged ring; and

a gauge ring is located between said flanged ring and those end faces of said rings of said roller bearings which are diametrically opposed to one another; said gauge ring having a first part which extends at substantially right angles to the axis of said shaft and is operatively connected to said flanged ring, said first part of said gauge ring being provided with means for effecting measurement of said axial force; said gauge ring also having a second part which is connected to said first part and is remote from said flanged ring, said second part of said gauge ring having pressure surfaces on two sides for effecting positive connection of said second part to said diametrically opposed end faces of said rings of said roller bearings.

4,419,902

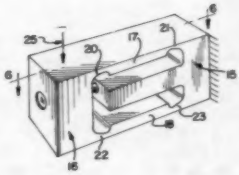
CONSTANT STRAIN LOAD CELL

Hardev S. Somal, LaPorte, Ind., assignor to Maatschappij Van Berkel's Patent N.V., Leidschendam, Netherlands

Filed Oct. 2, 1981, Ser. No. 308,113

Int. Cl.³ G01L 1/22

U.S. Cl. 73—862.65 7 Claims



1. In a constant strain load cell including a fixed end constraint, a movable end constraint, upper and lower flexures interconnecting the end constraints in parallelogram form, said end constraints being massive and of constant width therealong, said flexures being compliant and of constant width therealong, flexing areas at opposite ends of the flexures, and strain gages mounted at the flexing areas, the improvement being in the flexing areas which are of less thickness than the main body of the flexures and of uniform tapered thickness along their length from one end to the other end thereof such as to define constant stress areas along their entire length whereby bending of the areas will cause constant and equal tensile and compressive stresses along their length.

4,419,903

METHOD AND APPARATUS FOR DETECTING INSUFFICIENT LIQUID LEVELS

Delbert D. Jackson, Yorba Linda, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

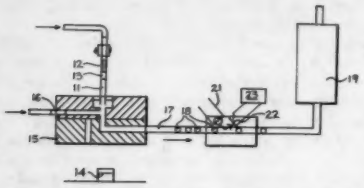
Filed Feb. 22, 1982, Ser. No. 350,697

Int. Cl.³ G01N 35/08

U.S. Cl. 73—864.01 4 Claims

1. In a liquid sampling apparatus including a probe for with-

drawing a first liquid volume from a container, a conduit into which said liquid volume may be expelled, and a source of a second liquid volume connected to said conduit, said second liquid volume to be mixed with said first liquid volume thereby generating air bubbles if said liquid volumes are insufficient; a device for detecting said insufficient volumes comprising:



electromagnetic means, associated with said conduit, for detecting the presence of said air bubbles; and

means, responsive to said detecting means, for counting said detected air bubbles.

4,419,904

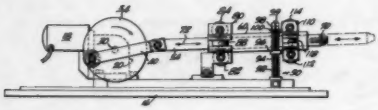
RECIPROCATING DEVICE

Randolph R. Albury, P.O. Box N 7512, Nassau, The Bahamas

Continuation-in-part of Ser. No. 14,872, Feb. 26, 1979, abandoned. This application Sep. 28, 1981, Ser. No. 306,179

Int. Cl.³ F16H *21/22*

U.S. Cl. 74—44 **3 Claims**



1. A reciprocating device comprising:

an elongate slide member having a first end, a second end, and an intermediate portion between the ends, and said slide member having slide surfaces;

a tubular member sized for telescopically receiving the intermediate portion;

a housing including a base;

said base including eccentric reciprocating means and means connecting the reciprocating means to the first end of the slide member for reciprocating movement,

said first end comprising a laterally projecting bar perpendicular to the slide member and symmetrical therewith;

a first vertically resilient mounting means comprising a vertically oriented spring support means, said spring support means having a lower end secured to the base and an upper end about which a washer and lock means are fitted,

a spring means about said support means, said spring means being held under tension by said washer and lock means and having an intermediate region, and,

connector means mobily attached to said intermediate region of the spring means and said tubular member, said connector means normally urging said tubular member to a first vertical position and yieldable vertically upon application of a vertical force on the second end of said slide member during generally horizontal reciprocation movement; and

mounting means on the slide member second end for connection with a driven removable working end;

said reciprocating means comprising,

a drive means having a drive shaft,

wheel means comprising a pair of wheels on a common axis opposed in confronting relation with the drive shaft intermediate the wheels,

a drive motor having gear means on the drive shaft for rotating the wheel means, each wheel means including an eccentric with a crank connecting each wheel to the bar of said slide member first end, to imparting eccentric reciprocating movement to the slide member.

4,419,905

BICYCLE TRANSMISSION

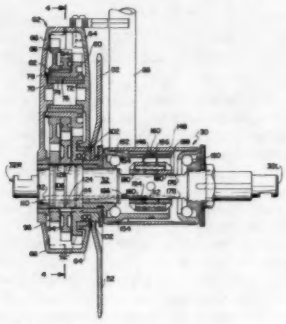
Fernand S. Lapeyre, 1224 Octavia St., New Orleans, La. 70115

Continuation of Ser. No. 810,112, Jun. 27, 1977, Pat. No. 4,283,969. This application Sep. 22, 1980, Ser. No. 189,728

The portion of the term of this patent subsequent to Aug. 18, 1998, has been disclaimed.

Int. Cl.³ F16H *31/00*; F16D *41/04*

U.S. Cl. 74—126 **2 Claims**



1. In a multi-speed transmission for bicycles,

a drive shaft rotatably displaceable in a forward and in a reverse direction within a frame pedal hub in response to pedal displacement,

collar means mounted on said drive shaft for rotation in conjunction therewith and permitted longitudinal displacement therealong intermediate a pair of spaced apart limiting positions, and

means remote from said drive shaft engageable with said collar means and selectively responsive to a limited predetermined arc of reverse rotative displacement of said drive shaft at a pair of diametrically opposed angular positions thereof for displacing said collar means in a selected direction longitudinally along said shaft from either one of said limiting positions toward the other.

4,419,906

TORQUE DIVISION GEARING CONNECTION ASSEMBLY

Gerhard Briehl, Bocholt, Fed. Rep. of Germany, assignor to WGW Westdeutsche Getriebe- und Kupplungswerke GmbH, Fed. Rep. of Germany

Filed Oct. 8, 1980, Ser. No. 195,004

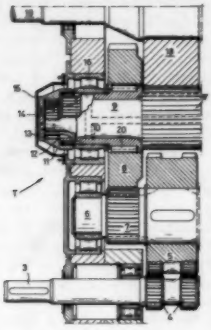
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1979, 2941553

Int. Cl.³ F16H *35/00*; F16D *1/12*

U.S. Cl. 74—413 **52 Claims**

1. A torque division gearing assembly apparatus having an input to at least two torque branch gear trains for driving a common output shaft, at least one torque branch gear train including a gear for driving an intermediate shaft having a pinion formed thereon for driving connection with a corresponding gear wheel connected with said output shaft, wherein the drive connection between said gear and said intermediate shaft comprises a connection bush having two gear teeth rings of different diametral pitches, one said ring for receiving torque transmission from said gear and the other for transmitting torque to said intermediate shaft, and a bushing

element rotatable about and relative to said intermediate shaft and having at one end key means for driving connection with



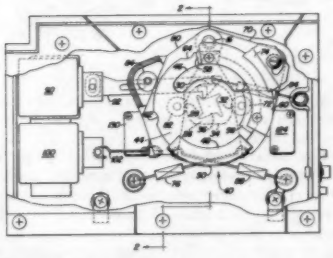
said gear and at the other end gear teeth means for corresponding meshing with one of said connection bush gear rings.

4,419,907

MULTIPLE MODE CONTROL LEVER ASSEMBLY

Kenneth D. Baxter, Cedar Falls, Iowa; Gary R. Bluem, Wayzata; Dallas R. Humphrey, Golden Valley, both of Minn.; Carl E. Kittle, Cedar Falls, Iowa, and Douglas J. Kluge, Golden Valley, Minn., assignors to Deere & Company, Moline, Ill.

Filed Dec. 23, 1981, Ser. No. 333,601
Int. Cl.³ G05G 5/06
U.S. Cl. 74—531 **16 Claims**



1. A multiple mode control lever assembly comprising:
a housing;
an operator-movable control lever;
pivot means for rotatably coupling the control lever to the housing;
a friction member for slidably engaging the control lever to resist rotation of the control lever relative to the housing, the friction member having a cam follower projecting therefrom;
a resilient member biased to urge the control lever from a displaced position to a neutral position;
an index cam mounted in the housing for rotation independent of the control lever and having can surfaces engageable with the follower, the index cam being rotatable between a first position wherein a first cam surface faces the follower to permit the friction member to slidably engage the control lever and a second position wherein a second cam surface engages the follower to hold the friction member spaced apart from the control lever; and
an index actuator mounted in the housing and including means for rotating the index cam among its positions.

4,419,908

MOLD AND METHOD OF MAKING SPOKED WHEELS AND PRODUCT OF SAME

Harold J. Reikowski, Southfield, Mich., assignor to Kelsey-Hayes Co., Romulus, Mich.

Filed Oct. 26, 1981, Ser. No. 314,541
Int. Cl.³ B29D 3/02; B29G 7/00
U.S. Cl. 74—552 **11 Claims**

1. A method of producing a spoked wheel from parallelly oriented fiber reinforced materials, comprising: providing a mold having a central support with an annular ring thereabout having a mold groove in its top surface adjacent its periphery, and at least two ramps connecting said groove with said central support, placing a segmental cover plate having a mold groove in its bottom surface over the mold groove in said annular ring and leaving an entrance channel between the ring and cover which communicates with the periphery of said ring and cover; placing a hub having parallel top and bottom flanges on said central support; wrapping binder impregnated parallel fibers into said entrance channel up said ramps, and between said flange of said hub until parallel fibers and binder build up in said mold grooves to said entrance channel; and forcing a wedge shaped member into said entrance channel to move the parallel fibers laterally to fill the mold grooves in the annular ring and its cover plate; and hardening the binder.

2. The method of claim 1 including the step of: placing a binder wetted reinforcement pad in the portion of said groove in said annular ring that is beneath said entrance channel and opposite said ramps before pulling the binder impregnated parallel fibers through said entrance channel.

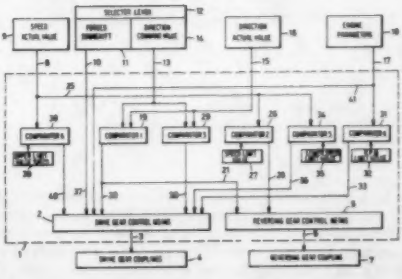
3. An armature for a wheel made by the method of claim 2.

4,419,909

METHOD OF CONTROLLING A POWER TRANSMISSION DEVICE AND CONTROL SYSTEM FOR CARRYING OUT SAID METHOD

Hans-Jörgen Opperud; Sven A. L. Carlsson, and Hans G. Ericson, all of Eskilstuna, Sweden, assignors to Volvo BM AB, Eskilstuna, Sweden

Filed Jun. 24, 1980, Ser. No. 162,675
Claims priority, application Sweden, Jun. 28, 1979, 7905695
Int. Cl.³ B60K 41/06
U.S. Cl. 74—856 **5 Claims**



1. In a method of controlling a power transmission device arranged between a driving engine and a drive axle and comprising a torque converter and a mechanical step gearbox, especially for vehicles such as wheeled loaders, comprising

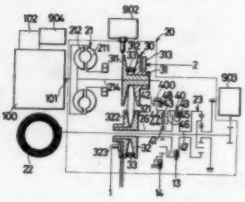
controlling the gearbox both automatically in response to engine parameters such as rotational speed and torque, and in response to a directional signal from a manually actuated direction selector control, emitting a command value for the rotational direction of the drive axle, delaying the reversal of the working direction of the gearbox until the speed is less than a predetermined limiting speed value if the speed of the vehicle or the rotational speed of the drive axle exceeds said value, and reversing the direction of the gearbox when the directional command value signal is changed to indicate the opposite rotational direction to the prevailing rotational direction of the drive axle so that during the subsequent retardation it works against the prevailing drive axle direction; the improvement comprising maintaining during the entire retardation that gear in engagement which is in engagement at the beginning of the retardation, downshifting immediately to the next-to-the-highest gear if the highest gear is engaged when the directional command signal is changed, and when the retardation has been completed and the speed of the axle and vehicle is zero, engaging the next-to-the-lowest gear of the gearbox for the subsequent acceleration.

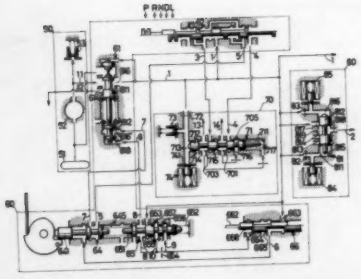
4,419,910

SHIFT CONTROL MECHANISM IN AN AUTOMATIC TRANSMISSION FOR VEHICLES

Nobuaki Miki, Kariya, and Shoji Yokoyama, Anjo, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Filed Apr. 10, 1981, Ser. No. 252,863
Claims priority, application Japan, Apr. 15, 1980, 55-50073
Int. Cl.³ B60K *41/04*
U.S. Cl. 74—867 **6 Claims**





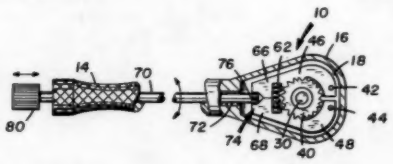
1. A shift control mechanism in an automatic transmission for vehicles, wherein a planetary gear transmission comprising a planetary gear set consisting of a sun gear, a ring gear, a planetary gear and a planetary carrier, one wet-type multi-plate clutch and one wet-type multi-plate brake is changed into forward and reverse drives by controlling hydraulic operation fluid supplied or discharged to hydraulic servo systems of the multi-plate clutch and the multi-plate brake, characterized in that said shift control mechanism comprises a shift control valve connecting the hydraulic servo systems with a hydraulic pressure source or a drain port selectively, and a solenoid valve controlling operation of the shift control valve in response to an electric control circuit, said shift control valve having a first oil chamber supplied with hydraulic pressure from the hydraulic pressure source through a fixed orifice; a spool for receiving said hydraulic pressure positioned at one end of said shift control valve, and connected to the first oil chamber, and a spring positioned opposite said spool; a second oil chamber connecting the hydraulic servo system to operate at least a servo system with the hydraulic pressure source or the drain port and supplying or discharging hydraulic pressure to said hydraulic servo system; a third oil chamber connecting the hydraulic servo system to operate the multi-plate clutch with a hydraulic pressure source or the drain port and supplying or discharging hydraulic pressure to said servo system; a fourth oil chamber effecting feedback of hydraulic pressure fed by the second oil chamber to said spool; and a fifth oil chamber effecting feedback of hydraulic pressure fed by the third oil chamber to the spool, wherein a pressure receiving area of the spool connected to the first oil chamber is larger than a pressure receiving area in the fourth or fifth oil chamber and the solenoid valve urges the spool of the shift control valve by controlling hydraulic pressure in the first oil chamber.

4,419,911

SOCKET DRIVE WRENCH AND PAWL AND RATCHET ASSEMBLY THEREFOR

Steven A. Claudy, 7206 Beatwoods Rd., Hanover, Md. 21076

Filed May 19, 1981, Ser. No. 265,230
Int. Cl.³ B25B *13/46*
U.S. Cl. 81—62 **25 Claims**



1. A socket drive wrench for driving sockets comprising:
a housing having a drive portion and a handle portion extending therefrom;
socket mounting means rotatably carried on said drive portion of said housing, said socket mounting means adapted to accept and removably mount thereon said sockets;
ratchet gear means connected to said socket mounting means and rotatable therewith;
a pair of pawls pivotably disposed on said drive portion of said housing about and for selectively engaging said ratchet gear means, said pawls being positionable to permit clockwise and counterclockwise ratcheting, freewheeling, and lockup of said ratchet gear means, each of said pawls having two ends, adjacent ends of said pawls being pivotably mounted to said housing, the other ends of said pawls being movable toward and away from each other, the teeth of each of said pawls engaging said ratchet gear means when said other ends of said pawls are moved toward each other, said teeth of each of said pawls disengaging said ratchet gear means when said other ends of said pawls are moved away from each other;
spring biasing means for urging said other ends of said pair of pawls toward each other to engage said ratchet gear means therebetween; and
pawl control means for positioning said pawls, said pawl control means for selectively contacting and positioning one of said pawls to permit clockwise rotation of said ratchet gear means and the other of said pawls to permit counterclockwise rotation, said pawl control means selectively engaging and positioning both of said pawls to permit freewheeling of said ratchet gear means, said pawl

control means selectively engaging and positioning both of said pawls to engage said ratchet gear means to effect the lockup thereof, said pawl control means comprising a control arm having first, second, third, and fourth positions, said control arm in said first position contacting one of said pawls and positioning the same so as to be disengaged from said ratchet gear means, said control arm in said second position contacting the other of said pawls and positioning the same so as to be disengaged from said ratchet gear means, said control arm in said third position engaging both of said pawls and positioning them so as to be disengaged from said ratchet gear means, said control arm in said fourth position permitting both of said pawls to engage said ratchet gear means.

4,419,912

VIBRATION THREADING LATHE FOR PRECISION SCREW CUTTING

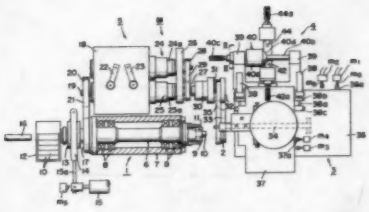
Tatuo Sotome, Hiratsuka, and Fumio Yokoi, Isehara, both of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo and Yugen Kaisha Shindo Sessaku Kenkyusho, Kofu, both of, Japan

Filed Jun. 16, 1981, Ser. No. 274,356

Claims priority, application Japan, Jun. 24, 1980, 55-85494

Int. Cl.³ B23B 5/24

U.S. Cl. 82—5 **8 Claims**



1. A vibration threading lathe for precision screw cutting, comprising:

a main spindle having a hollow interior and a chuck at one end thereof;

a blank feeding device for feeding blanks one-by-one through said hollow spindle from the other end and to said chuck to be held thereby at said one end of said main spindle;

means for rotatably driving said main spindle;

a travelling carriage assembly on said lathe adjacent said one end of said main spindle and having a saddle mounted thereon for movement in the axial direction of said main spindle, means connected with said saddle for moving said saddle toward said main spindle at a speed corresponding with the pitch of the screw threads being cut, a cross slide mounted on said travelling carriage for movement perpendicular to the direction of movement of said saddle, and carriage control means for controlling the movement of said saddle and said cross slide;

a tool rest mounted on said cross slide and having a tiltable frame;

a cutting tool mounted in said tiltable frame, said tiltable frame being adjustably mounted on said tool rest for adjustment of the position thereof relative to said tool rest for varying the position of the cutting tip of the cutting tool relative to a blank held in said chuck; and

a vibrator mounted on said cross slide and coupled to said cutting tool for causing said cutting tool to vibrate during the screw cutting operation thereof.

4,419,913

METHOD OF CUTTING PATTERNS IN WEB MATERIAL

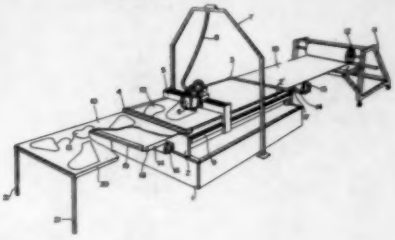
Eduard Schütt, Hamburg, and Günter Heil, Elleran, both of Fed. Rep. of Germany, assignors to Aristo Graphic Systeme GmbH & Co., KG, Hamburg, Fed. Rep. of Germany

Filed Aug. 20, 1981, Ser. No. 294,686

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034621

Int. Cl.³ B26D 7/20

U.S. Cl. 83—27 **10 Claims**



1. Method of cutting patterns in a web of pattern material comprising:

A. longitudinally advancing a web of pattern material onto a cutting surface;

B. simultaneously longitudinally advancing a web of rough surface material in parallel with the web of pattern material, such that the web of rough surface material abuts the underside of the pattern material while pulling a vacuum against the underside of the pattern material through the rough surface material, such that the pattern material adheres to the rough surface material during said cutting;

C. cutting a pattern in that portion of pattern material within the confines of said cutting surface, such that burrs are formed on the underside of the pattern material and the burrs act as hooks to engage the rough surface material;

D. releasing said vacuum and then simultaneously advancing the web of pattern material and the web of rough surface material away from the cutting surface as a consequence of said burr and rough surface engagement; and

E. separating the web of rough surface material from the web of pattern material, such that the cut pattern may be removed.

4,419,914

CANT PRODUCTION

Tony L. Evans, P.O. Box 415, Ozark, Mo. 65721

Filed Nov. 28, 1978, Ser. No. 965,386

Int. Cl.³ B27B 5/34, 31/04

U.S. Cl. 83—407 **13 Claims**

1. A sawmill assembly comprising

a pair of circular saws rotatable about a common horizontal axis and spaced from each other along said axis, said saws comprising a first set of saws;

a second set of saws substantially identical to said first set of saws;

a frame assembly mounting said first and second saws substantially in-line in a generally horizontal dimension generally transverse to said axes of said first and second saw set pairs;

means for feeding an article to be cut to said first saw set, a main portion of the article passing through the space between said saws of said first saw set, and side portions of the article being separated from the main portion;

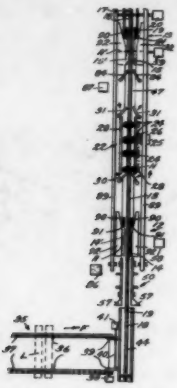
means for feeding an article to be cut to said second saw set, a main portion of the article passing through the space between said saws of said second saw set, and side portions of the article being separated from the main portion;

means for facilitating the rotation of the article 90° about an

axis along said horizontal dimension, said means being disposed intermediate said first and second saw sets;

means for mounting said saws of each of said first and second saw sets for axial movement along said axes of rotation thereof, said means comprising a common splined shaft received by an interior collar of each of said saws;

and power means associated with each saw set for effecting



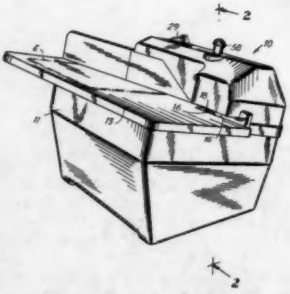
automatic detented adjustment of the distance between said saws, said power means comprising a fluid-actuated cylinder assembly operatively mounted to said frame assembly and including a cylinder and a pair of rams, a collar operatively attached to each ram straddling one of the saws of the respective saw set, and a stop operatively attached to said frame assembly for limiting the movement of each of said collars.

4,419,915

ENVELOPE OPENER DEVICE

James J. Oussani, Brooklyn, N.Y., assignor to The Staplex Company, Inc., Brooklyn, N.Y.

Filed Jan. 19, 1982, Ser. No. 340,696
Int. Cl.³ B43M *7/02*
U.S. Cl. 83—887 **4 Claims**



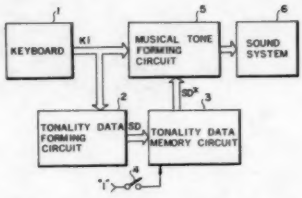
1. An envelope opener device for effecting a slit adjacent a margin through the upper layer only of an envelope or the like comprising a planar support table having its longitudinal axis arrayed in a horizontal plane and having its transverse axis inclined to the horizontal to define upper and lower marginal side edges, a stop fence in abutting relation to the lower marginal edges of said table, said fence being disposed substantially at right angles to said table, an aperture formed in said table in proximate spaced relation to said fence, a circular rotary knife member including a sharpened peripheral portion extending upwardly through said table, said knife member projecting upwardly beyond said table a distance at least equal to the thickness of the paper of the envelope to be processed, drive means for rotating said knife member about an axis of rotation parallel to the plane of said table and normal to the longitudinal axis of said table, a bushing mounted above said table and including an aperture, a stub shaft including an extension shaft rotatably mounted in said aperture, said stub shaft and extension shaft having parallel, laterally offset axes, a holddown wheel mounted on said stub shaft, said wheel being rotatable about said stub shaft about an axis parallel to the axis of rotation of said knife, the periphery of said wheel being spaced from the periphery of said knife a first preset distance less than the thickness of the stock of an envelope to be processed, and adjustment means for rotating said extension shaft relative to said bushing, thereby to shift said hold-down wheel from said first preset distance to a second and closer preset distance from said knife periphery for the processing of envelopes formed of thinner stock than said first preset distance.

4,419,916

ELECTRONIC MUSICAL INSTRUMENT EMPLOYING KEYBOARD TONALITY DESIGNATION SYSTEM

Eiichiro Aoki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 16, 1982, Ser. No. 348,673
Claims priority, application Japan, Feb. 18, 1981, 56-22407
Int. Cl.³ G10H *1/18, 1/22, 1/38*
U.S. Cl. 84—1.01 **19 Claims**



1. A tonality designation system of an electronic musical instrument capable of designating tonality by means of a keyboard, comprising:

a keyboard having plurality of keys,

a keynote data forming circuit for forming a key note data representative of a keynote of a tonality to be performed based on key depression of said keyboard,

scale designating means for designating a type of scale and for outputting a scale data representative of the designated type of scale, and

memory means for storing said keynote data and said scale data as data for specifying tonality.

4,419,917

POWER SAVING DEVICE FOR AN ELECTRONIC MUSICAL INSTRUMENT

Kunio Sato, Houya, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 185,411, Sep. 9, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 427,129
Claims priority, application Japan, Sep. 13, 1979, 54-116685
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.01 **11 Claims**

1. A power saving device for an electronic musical instrument comprising:

a source of power;

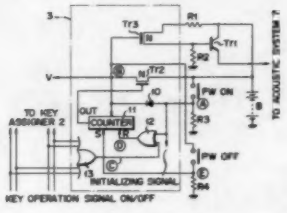
tone generating means including at least one LSI chip for generating tone signals;

an acoustic system coupled to said tone generating means for converting said tone signals to audio signals;

a keyboard including a plurality of performance keys;

power-on switch means including first and second transistors, said power source switch means being coupled to said power source for supplying power to said tone generating means by means of said first transistor, and for supplying power to said acoustic system by means of said second transistor;

time-counting means for counting a given period of time from an initial state at the time of a power-on state set by said power-on switch means to a given time, and for generating a control signal at the end of said given period of time;



means coupled to said keyboard for setting said time-counting means to the initial state thereof everytime any key of said keyboard is depressed;

a power-off switch for generating said control signal when operated; and

control means coupled to said time-counting means and to said power-off switch, and including means responsive to said control signal from said time-counting means or from said power off switch, for stopping the supply of power to both said tone generating means and to said acoustic system, by turning off said first and second transistors.

4,419,918

SYNCHRONIZING SIGNAL GENERATOR AND AN ELECTRONIC MUSICAL INSTRUMENT USING THE SAME

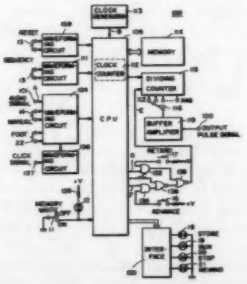
Ralph Dyck, and Peter Dunick, both of Vancouver, Canada, assignors to Roland Corporation, Osaka, Japan

Filed Jan. 27, 1982, Ser. No. 343,091

Claims priority, application Japan, Feb. 17, 1981, 56-23651

Int. Cl.³ G10H *1/40*

U.S. Cl. 84—1.03 **22 Claims**



1. A synchronizing signal generator comprising: an input terminal for applying pulse signals to said generator; clock signal generating means for generating clock signals; counting means (**112**) connected to said clock signal generating means for counting the clock signals from said clock signal generating means in synchronism with the pulse signals applied to said input terminal to provide a count of clock signals; signal dividing means (**105**) operatively connected to said counting means for dividing by a predetermined numeral value the number of the count of clock signals counted by said counting means during a length of time beginning when a particular one of said pulse signals is applied and ending when the next succeeding pulse signal is applied to provide a first quotient value; storing means (**114**) connected for storing at least either of said count of clock signals and the first quotient value representing the result of said division; and output signal means (**115, 116, 119**) operatively connected to said signal dividing means (**105**) for providing an output signal (at **120**) when a certain coincidence condition is met, said certain coincidence condition occurring when the number of counted clock signals corresponds to said first quotient value fetched from said storing means through said signal dividing means or when the number of counted clock signals corresponds to the result of a further division providing a second quotient value fetched from said storing means.

4,419,919

ELECTRONIC MUSICAL INSTRUMENT

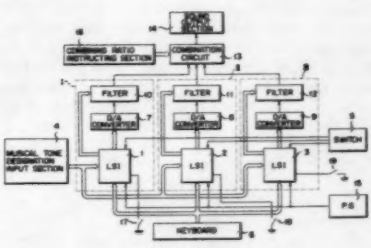
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 74,416, Sep. 11, 1979, abandoned. This application Jun. 18, 1981, Ser. No. 274,717

Claims priority, application Japan, Sep. 14, 1978, 53-113000; Sep. 14, 1978, 53-113001; Dec. 27, 1978, 53-164864

Int. Cl.³ G10H *1/02, 1/46, 7/00*

U.S. Cl. 84—1.27 **7 Claims**



1. A digital electronic musical instrument comprising:

a keyboard including a set of performance keys;

a plurality of musical tone generating means, each of said musical tone generating means being of substantially the same circuit structure, and each of said musical tone generating means being constituted by one LSI chip;

each of said musical tone generating means including a waveform generating means for digitally generating a waveform signal; and a volume envelope controlling means coupled to said waveform generating means for digitally controlling a volume envelope and for generating an envelope-controlled waveform signal;

means coupled to said plurality of musical tone generating means for operating all of the musical tone generating means upon operation of said performance keys;

a plurality of digital-analog converter means, coupled to each of said musical tone generating means correspondingly, for converting said envelope-controlled waveform signal into an analog signal;

filter means coupled to said plurality of digital-analog converter means for filtering said analog signal; and

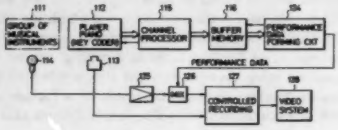
output means coupled to said filter means for synthesizing the musical tone signals from said filter means to thereby provide a musical tone.

4,419,920

APPARATUS FOR RECORDING AND REPRODUCING MUSICAL PERFORMANCE

Ichiro Ohe, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 8, 1982, Ser. No. 396,360
Claims priority, application Japan, Jul. 16, 1981, 56-111429; Jul. 21, 1981, 56-114246; Jul. 23, 1981, 56-115560
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—115 14 Claims



1. An apparatus for recording and reproducing a musical performance, comprising:

a recording section including a video system for recording in a composite form (a) an image signal obtained by photographing a scene of a performance of musical instruments, (b) a sound signal obtained by detecting a performance sound of said musical instruments, said sound signal substantially excluding the sound of a certain musical instrument, and (c) digital performance data indicative of the performance of said certain musical instrument; and

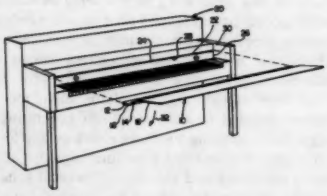
a reproducing section for separating the recorded image signal, sound signal and performance data relative to each other by a reproduction of the record obtained by said video system, and for reproducing an image from the separated image signal, and a sound from the separated sound signal, and for using said performance data to drive an automatically playing musical instrument corresponding to said certain musical instrument to make an automatic real performance based on said performance data.

4,419,921

PIANO KEYBOARD SHIELD

Edward G. Simanski, 3005 Spruce Ave., Altoona, Pa. 16601

Filed Jun. 7, 1982, Ser. No. 385,509
Int. Cl.³ G09B *15/06*
U.S. Cl. 84—467 5 Claims



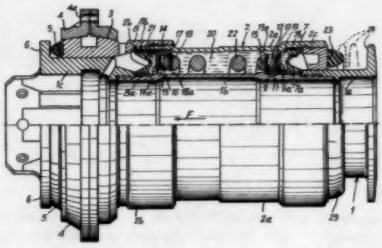
1. A unitary keyboard shield adapted to be attached to a piano of the type having a laterally extending gap, or slot, in a vertical section located at the rear of the keyboard, said shield, when attached to the piano, including a cover portion interrupting a player's line of vision to at least a portion of said keyboard, the improvement wherein said shield includes a rear section engageable within said slot for attaching the shield to the piano, said rear section being substantially planar, thinner than the slot, and inclined upwardly and rearwardly.

4,419,922

RECOIL CUSHIONING DEVICE, PARTICULARLY FOR QUICK-FIRING WEAPONS

Gildas Le Pierres, Boutigny-sur-Essonne, France, assignor to Vibrachoc, Saint Cloud, France

Filed Mar. 9, 1981, Ser. No. 241,615
Claims priority, application France, Mar. 12, 1980, 80 05490
Int. Cl.³ F41F *19/14*
U.S. Cl. 89—43 R 10 Claims



1. A recoil cushioning device, for quickfiring automatic weapons adapted to be operated at two different firing rates, located between a recoiling part of the weapon and a fixed part which guides the recoiling part, of the type exerting a cushioning force on the recoiling part during the recoil movement and exerting no substantial cushioning force during the return movement, wherein it comprises cushioning means for cushioning the recoiling part during any portion of the recoil travel, said cushioning means being associated with a first elastic recovery means having a first rigidity during the recoils of and being operative during the oscillation of said recoiling part corresponding to a first firing rate and second elastic recovery means which are only operated when the recoil amplitude exceeds a certain value and having an elasticity permitting them, in conjunction with said elastic recovery means, to secure a second higher rigidity during oscillation of said recoiling part corresponding to the recoils of a second higher firing rate

wherein the cushioning means comprises, between the fixed part and the recoiling part, a chamber sealed at its front and rear ends by sealing members permitting the chamber to retain its volume during the movements of said recoiling part, said chamber being subdivided into at least two areas, whereof one is reduced in complementary manner to the increase of the other area during recoil, so as to pass a cushioning fluid from one area to the other via constricting passages,

and wherein the chamber is subdivided by a first partition fixed to the recoiling part and a second partition fixed to the fixed part into three areas, namely a front area, an intermediate area and a rear area, filled with a cushioning fluid, the intermediate area being linked with the two other areas during the recoil movement which reduces the size of said intermediate area, by constricting passages whereas during the return movement which increases its size, said intermediate area can be connected with the other areas by wide passages.

4,419,923

TOGGLE ASSEMBLY FOR VEHICLES OR CARS

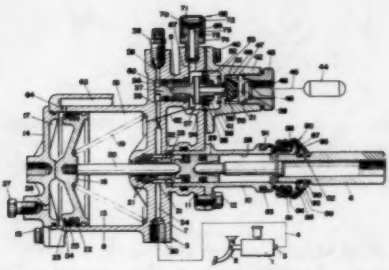
Hiroshi Kasahara, Ueda, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Nagano, Japan

Filed Jul. 7, 1980, Ser. No. 166,379

Claims priority, application Japan, Jul. 17, 1979, 54-98442[U]; Jul. 31, 1979, 54-105816[U]; Jul. 31, 1979, 54-105817[U]; Aug. 30, 1979, 54-119309[U]

Int. Cl.³ F15B *17/02*

U.S. Cl. 91—460 4 Claims



1. A toggle assembly for vehicles or cars comprising a relay cylinder mounted on an end plate including a booster cylinder and an output cylinder, a control chmber arranged in coaxial relation to the relay cylinder, a control valve for controlling a gas by a hydraulic pressure of a master cylinder, said valve being arranged in operable association with the control chamber, and a booster piston disposed in the booster cylinder and in operable association with the controlled gas, wherein said end plate is provided with a shell for said booster cylinder as an integral piece, said booster piston dividing said booster cylinder into a front chamber between the piston and the end plate and a back chamber between the piston and the end of the booster cylinder opposite the end plate, said shell is integrally provided with a first compressed air passage having its one end being open in the back chamber of the booster cylinder for the booster piston and its other end passing through said end plate and being open at the end of a relay valve body, and a second compressed air passage is provided to extend from a casing for said control chamber, said second passage having its one end in communication with the other open end of said first passage and its other end in communication with said control chamber, and wherein a water- and dust-proof boot is interposed between the output push rod and the output cylinder body, said boot including a bellows section disposed for making a connection between first and second portions to which are fitted the output push rod and the output cylinder body, respectively, and a cover section provided to extend from said first portion such that the distal end thereof is brought in resiliently close contact with a crest portion of said bellows section to define an annular expansion chamber around the outer surface of said first portion, the respective end walls of said bellows and cover sections facing each other through said expansion chamber being provided therein with ventilation holes.

4,419,924

BRAKE ASSEMBLY FOR FLUID OPERATED PISTON AND CYLINDER DEVICE

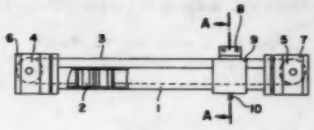
Oskar Peter, Frauenstein 26, D 7481 Bingen, and Anton Stahr, Zellerhornstr. 22, D800 Munich, 900, both of Fed. Rep. of Germany

Filed Nov. 7, 1980, Ser. No. 204,835

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945133

Int. Cl.³ F15B *15/26*

U.S. Cl. 92—27 10 Claims



1. A brake assembly for a fluid operated piston and cylinder device of the type wherein drive means are connected to the piston to longitudinally move the piston relative to the cylinder, said piston having no piston rod, said device further having a force applying cross head movably disposed on the cylinder's outer wall surface and connected to said drive means for longitudinal movement with the piston, said assembly being integrated within the cross head and comprising at least one brake lining concentrically arranged about the cylinder for engagement with the outer wall surface of the cylinder and means for urging said brake lining into engagement with the cylinder's outer wall surface whereby to stop, lock and/or longitudinally position the piston with the cylinder.

4,419,925

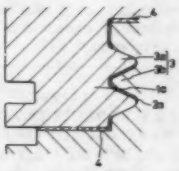
ASSEMBLED PISTON FOR ENGINE

Yoshihiko Tsuzuki, Nagoya; Kiyoshi Uchida, and Toshio Tanahashi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation-in-part of Ser. No. 35,682, May 3, 1979, Pat. No. 4,343,229. This application Dec. 9, 1980, Ser. No. 214,504

Int. Cl.³ F16J *1/00*

U.S. Cl. 92—212 12 Claims



1. An assembled engine piston comprising 01401/

a metal body member having an axially extending annular recess at the top end thereof, said recess extending to a top surface of said body,

a ceramic material head member on the top of said body, said head comprising an axially extending annular projection extending into said recess,

radially extending interengaging means within said recess and on said projection and said body for securing said head to said body against relative axial movement in response to rotation of said head with respect to said body, said interengaging means comprising at least two rows of threads of conical section on said projection, and threads on said body, said rows of threads comprising an upper thread and a lower thread, said lower thread of said projection having an inclined lower surface engaged by a correspondingly inclined lower surface of a body thread, and said upper thread having

an inclined upper surface engaged by a correspondingly inclined upper surface of a body thread, so that the threads of said body exert forces on the threads of said projection which tend to compress the portion of the projection between said upper and lower threads, and

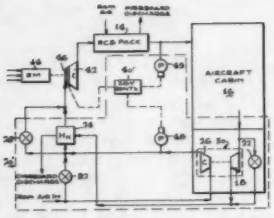
means to prevent relative rotation of said head and body.

4,419,926

ESC ENERGY RECOVERY SYSTEM FOR FUEL-EFFICIENT AIRCRAFT

Michael J. Cronin, Sherman Oaks, and Gordon Seid, Los Angeles, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Sep. 2, 1980, Ser. No. 183,499
Int. Cl.³ B64D *13/02*
U.S. Cl. 98—1.5 **12 Claims**



1. An aircraft environmental control system for supplying a predetermined amount of conditioned air to an aircraft cabin, comprising:

an electric motor;

a cabin compressor arranged to be driven by said electric motor, said cabin compressor having an outlet adapted and arranged to supply heated and pressurized air to said cabin;

a supercharging compressor connected in series between a source of fresh air and an inlet of said motor-driven cabin compressor;

a free-running turbine mechanically coupled to said supercharging compressor to form a turbo-compressor arranged and adapted to be driven solely by discharge air emanating from said cabin, whereby the inlet of said motordriven cabin compressor may be provided with pressurized fresh air when said cabin is discharging pressurized air overboard.

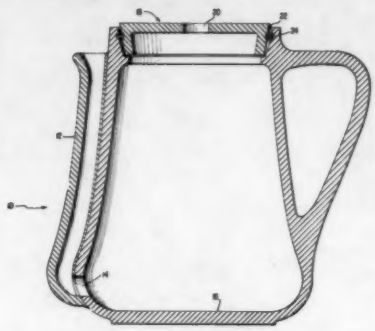
4,419,927

DECANTER FOR REDUCING OXIDATION AND EVAPORATION OF COFFEE

Wayne B. Stone, Jr., Bethesda, Md., assignor to Wood Manufacturing Co., Inc., North Flippin, Ark.

Filed Feb. 11, 1981, Ser. No. 233,505
Int. Cl.³ A23F *1/08*
U.S. Cl. 99—275 **9 Claims**

1. A coffee decanter including a body portion having a bottom and sides which define a container for receiving coffee, the upper portion of said sides defining a mouth for ingress of coffee to within said container, a pour spout for egress of coffee from said container, and a top assembly removably received by said mouth for providing a cover contiguous to and across said mouth; said pour spout having a lower inlet opening through one side of said body portion to the interior of said container in adjacency to said bottom thereof and with the entire opening thereof below the lower quarter of the fill level thereof, extending to a height so that coffee will not overflow therefrom on filling of said container with coffee, and having a relatively small upper outlet opening; at least the upper portion of said container and said pour spout consisting of a material exhibiting poor thermal conductivity and in which the thermal gradient of such material in relation to the thickness and the height thereof are interrelated to consequentially facilitate a temperature differential in an appreciable volume of coffee within the decanter such that the upper level of coffee there-



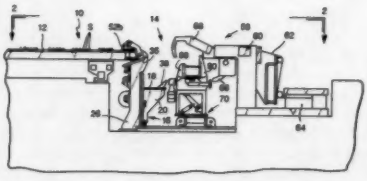
within is cooler than the lower level of coffee therewithin and the upper level of coffee in said pour spout is appreciably cooler than both the upper and lower level of coffee within the decanter.

4,419,928

BUNDLING AND STACKING APPARATUS

Kenneth L. Klusmier, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed May 17, 1982, Ser. No. 378,837
Int. Cl.³ B65B *13/18*
U.S. Cl. 100—7 **13 Claims**



1. A material handling apparatus having a first operational mode for bundling batches of a first type of elongated element with round cross-sectional profiles, and having a second operational mode for stacking batches of a second type of elongated element with shaped flat-sided cross-sectional profiles, said apparatus comprising:

a conveyor means for laterally transporting batches of either of said types of elements in side-by-side relationship to a bundling and stacking station;

a vertically adjustable elevator means at said station for receiving either of said types of elements;

a first transfer means operable during said first operational mode to laterally direct the first type of elongated elements onto said elevator means;

stationary members cooperating with operatively positioned movable members when said apparatus is in said first operational mode to laterally confine the first type of elements into a bundle on said elevator means as said elements are received from said conveyor means, said movable members being adjustable to inoperative positions to accommodate lateral removal of a bundle of said first type of elements from said elevator means and also to convert said apparatus from said first to said second operational mode; and

second transfer means operable during the second operational mode of said apparatus for transferring layers of said second

type of element from said conveyor means onto said elevator means to form a stack thereon, said second transfer means being adjustable to an inoperative position removed from said conveyor means when converting said apparatus from said second to said first operational mode.

4. The apparatus of claim 1 further comprising tieing means arranged on the side of said bundling and stacking station opposite to that occupied by said conveyor means, and carriage means for laterally transferring either bundles of said first type of elongated elements or stacks of said second type of elongated elements from said bundling and stacking station to said tieing means, said tieing means being operative to tie either said bundles on said stacks into integral units.

4,419,929

PRESS DRIVE

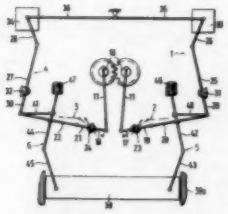
Hans-Martin Dommer, Goppingen; Alfred Bareis, Uhingen, and Ewald Bergmann, Rechberghausen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Feb. 11, 1982, Ser. No. 348,015

Claims priority, application European Pat. Off., Feb. 11, 1981, 81100932

Int. Cl.³ B30B *1/26*

U.S. Cl. 100—257 **15 Claims**



1. A press drive for a high speed press, the press drive including a pair of oppositely driven eccentric shaft means, connecting means for connecting the eccentric shaft means with a slide means of the press, and mass balancing weight means corresponding to reciprocating masses of the press and acting in a direction opposite to the reciprocating masses, characterized in that the connecting means includes at least three pairs of toggle joint linkage means, each pair of toggle joint linkage means are symmetrically disposed with respect to the eccentric shaft means, a pair of connecting rod means each having a first end respectively connected to the eccentric shaft means, the first pair of toggle joint means are each nearly horizontally disposed and are respectively connected to a second end of the connecting rod means, means are provided for supporting each of the pair of first toggle joint linkage means at a frame of the press, the second pair of toggle joint linkage means is nearly vertically disposed and each is respectively connected to the first toggle joint linkage means and the mass balancing weight means, and the third pair of toggle joint linkage means is nearly vertically disposed and are respectively connected to the slide means, means are provided for respectively articulatingly connecting each of the third toggle joint linkage means with the first pair of toggle joint linkage means, and in that means are provided for supporting each of the third pair of toggle joint linkage means on the frame of the press in a direction of movement of the slide means.

4,419,930

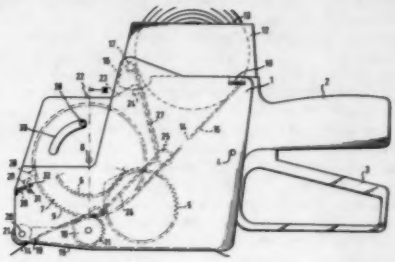
HAND LABELLING APPARATUS

Günter Holland-Letz, Hirschhorn, Fed. Rep. of Germany, assignor to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Jul. 17, 1981, Ser. No. 284,205

Int. Cl.³ B41T *1/22*

U.S. Cl. 101—93.18 **11 Claims**



1. Hand labelling apparatus for imprinting and dispensing pressure-sensitive labels adhering to a carrier tape, comprising a housing having at its rear end a grip and an operating lever pivotal against said grip, a rotary printing mechanism adapted to rotate about an axis and to be operated by the operating lever via a gear connection, said rotary printing mechanism being disposed in the front region of the housing and driveable by the operating lever, and a feed means disposed in the housing and driveable by the operating lever for feeding the carrier tape from a supply roll to the printing mechanism and to a peel edge at which the pressure-sensitive labels detach from the carrier tape and move into a dispensing position beneath an applicator roll rotatably mounted at the front end of the lower side of the housing, wherein the rotary printing mechanism is disposed in a frame which is connected to the housing pivotally about a shaft disposed near the lower end of the end face of the housing, and wherein the frame can be locked in the housing, or pivoted to more the printing mechanism out of the housing, said pivoting movement causing disengagement of the gear connection between the rotary printing mechanism and the operating lever.

4,419,931

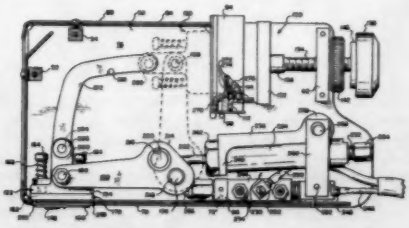
RECIPROCABLE IMPRINTING APPARATUS

Burton L. Siegal, Skokie, Ill., assignor to Kiwi Coders Corporation, Wheeling, Ill.

Filed Jul. 21, 1981, Ser. No. 285,444

Int. Cl.³ B41K *1/42*

U.S. Cl. 101—333 **9 Claims**



1. In an article imprinting apparatus which includes imprinting head means carrying type font means for applying an imprint to the surface of an object, inking cartridge means having an exposed inking surface adapted to be engaged by said type font means during a rest condition whereat a sealed

engagement is established between the imprinting head means and the inking cartridge means, drive means for translating said imprinting head means in an imprinting stroke and a return stroke between the rest condition and an imprinting position angularly disposed from said inking cartridge means through a path encompassing approximately ninety degrees of arc, and linkage means including a drive link pivotally mounted at one end to a stationary pivot point and at the opposite end to a movable pivot point, and a drive plunger for actuating said drive link, said imprinting head means being coupled to the movable pivot point whereby to effect the translation and guide means for controlling the rotation of said imprinting head means about the movable pivot point, said imprinting head means being rotated simultaneously with the translation thereof along said path, the improvement comprising said guide means comprising cam and follower means, said follower means being pivotally mounted to said imprinting head means at a location off set from the movable pivot point and movable therewith during translation of the imprinting head means, said imprinting head means being rotatable about the movable pivot point at a constant rotational acceleration relative to the drive link as said imprinting head means is translated along the length of said arc, the rate of change of rotational velocity of the imprinting head means per degree of rotation of the drive link being uniformly accelerated, the velocity of rotation of the imprinting head means being uniform at the locations proximate the ends of said path with the velocity of rotation increasing in accordance with the uniform rotational acceleration to the midpath of the strokes and decreasing under uniform deceleration to a location proximate the end of the path.

4,419,932

SEPARATOR FOR INK FOUNTAIN

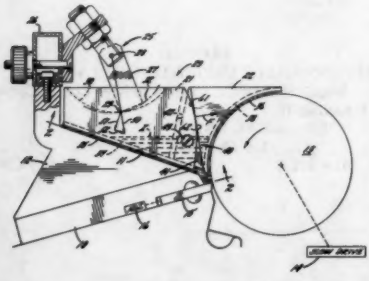
Bert Cappel, Muhlheim, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 16, 1981, Ser. No. 331,214

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1980, 8034726[U]

Int. Cl.³ B41F 1/46

U.S. Cl. 101—363 **6 Claims**



1. For use in an ink fountain of the type having a trough with a flat sloping bottom wall terminating in an edge, a fountain roller rotatable about an axis and having a cylindrical surface extending closely parallel to said edge with means for driving the fountain roller so that ink is fed in the form of a thick film at the edge of the bottom wall, the combination comprising a movable partition for dividing the trough into adjacent feeding and non-feeding sections, said partition comprising a trough-engaging portion having a straight face and a separate roller-engaging portion having an arcuate face, the portions having adjacent edges, the portions being arranged in a vertical plane with their adjacent edges in overlapping relation to block escape of ink, the portions having resilient sealing strips secured to the faces thereof for sealing against the flat bottom wall of the trough and the cylindrical surface of the roller respectively, the portions having force transmitting abutments for transmission of force perpendicular to said axis between them, one of said abutments being a curved surface so as to provide line contact between said abutments, the portions being pivoted together in the region of overlap by a pivot which extends parallel to the roller axis, means for clamping the trough-engaging portion downwardly and forwardly in the direction of the fountain roller, the pivot being loosely fitted to provide play in all directions in the plane of the partition so that, when the trough-engaging portion is seated on the sloping surface of the trough and clamped downwardly and forwardly in the direction of the fountain roller, the roller-engaging portion is free to undergo slight rocking and translational movement with respect to the trough-engaging portion for intimate seating of the arcuate edge thereof on the fountain roller notwithstanding variations in the transverse positioning of the roller axis vertically and horizontally with respect to the bottom walls of the trough.

4,419,933

APPARATUS AND METHOD FOR SELECTIVELY ACTIVATING PLURAL ELECTRICAL LOADS AT PREDETERMINED RELATIVE TIMES

Ian J. Kirby, Warrington; Michael I. Mitchell, Chester, and Andrew Stratton, Farnborough, all of England, assignors to Imperial Chemical Industries Limited, London, England

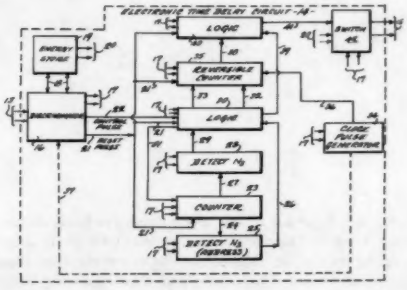
Division of Ser. No. 5,551, Jan. 22, 1979, Pat. No. 4,324,182.

This application Oct. 1, 1981, Ser. No. 307,633

Claims priority, application United Kingdom, Feb. 2, 1978, 4057/78

Int. Cl.³ F42C 11/00

U.S. Cl. 102—206 **13 Claims**



1. A system for energizing a series of electrical loads in predetermined timed sequence after a starting signal, which system comprises:

a supply of electrical energy,

means to generate a train of accurately timed control signals, and

a time control switching circuit for each load for connecting said supply to the corresponding load at a desired time, each of said switching circuits comprising:

means to receive said train of control signals,

a preset signal selecting system having means to select a first and a second of said control signals and to generate first and second timing signals in response to said first and second control signals respectively,

means to generate a starting signal, and

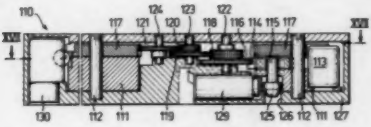
timing means to measure the interval between said first and second timing signals by counting locally generated timing pulses and to generate an output signal whereby the corresponding load is connected to an energy supply at a time interval after the starting signal determined by the interval between the first and second timing signals.

4,419,934

SAFETY APPARATUS FOR A SPINNING PROJECTILE FUSE

Robert Apotheloz, Greifensee, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed Aug. 3, 1981, Ser. No. 289,294
Claims priority, application Switzerland, Aug. 28, 1980, 6485/80; Jun. 9, 1981, 3792/81
Int. Cl.³ F42C *15/26*
U.S. Cl. 102—233 11 Claims



1. A safety apparatus for use with a spinning projectile containing a reinforcement charge and a fuze, comprising:

a rotor having a rotor axis;

said rotor, upon firing of the projectile, being movable out of a blocking position into an armed position and the rotor axis being mounted externally of the spin axis of the projectile;

a restraining mechanism cooperating with said rotor;

said restraining mechanism releasing the rotor, after firing of the projectile and following a time delay, to enable said rotor to rotate into the armed position;

a first safety element cooperating with said rotor;

said first safety element responding to the firing acceleration and the spin of the projectile, in order to release the rotor for its rotation into the armed position;

a second safety element cooperating with said rotor;

said second safety element responding to the spin of the projectile in order to release the rotor for its rotation into the armed position;

a housing accommodating said rotor, said restraining mechanism, said first and said second safety element and forming a structural unit placed intermediate the fuze and the reinforcement charge in the assembled state of the spinning projectile;

housing means within which there are arranged said safety elements; and

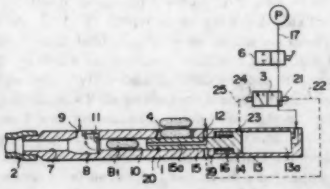
said housing means for said safety elements being mountable as a unit in said housing.

4,419,935

EXPLOSIVE CHARGING APPARATUS FOR CHARGING EXPLOSIVE PELLETS TO A BORE IN A ROCK

Takao Shibukawa, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jan. 7, 1983, Ser. No. 456,507
Claims priority, application Japan, Jan. 9, 1982, 57-1626[U]
Int. Cl.³ F42B *3/00*
U.S. Cl. 102—313 7 Claims



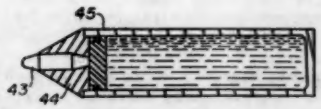
1. An explosive charging apparatus comprising charging pipe means adapted to be inserted into a bore drilled in a rock, body means connected to one end of said charging pipe means and having explosive guiding bore means extending axially in the body means so as to communicate at one end with said charging pipe means, said body means being formed with radially outwardly opening explosive supplying port means leading to an intermediate portion of said guiding bore means, cylinder means provided adjacent to the other end of said guiding bore means and having piston disposed in the cylinder means for reciprocating movement therein to and away from said guiding bore means, biasing means for urging said piston means away from the guiding bore means, rod means having one end connected with said piston means and the other end inserted into the guiding bore means so that said other end of the rod means is movable in response to a movement of said piston means between a retracted position wherein it is between the supplying port means and said other end of the guiding bore means and an advanced position wherein said other end of the rod means is advanced in the guiding bore means beyond said supplying port means whereby said supplying port means is opened to said guiding bore means when the rod means is in the retracted position to make it possible to supply an explosive to said guiding bore means but closed by said rod means when the rod means is in the advanced position, compressed air supply passage means formed in said body means and communicating with compressed air source means, air passage means formed in said rod means for connecting said compressed air supply passage means to said guiding bore means when said rod means is in the advanced position, valve means having a first position wherein said cylinder means is connected with the compressed air source means to move said piston means against said biasing means and a second position wherein said cylinder means is opened to atmosphere whereby the piston means is moved under said biasing means, said valve means being associated with first pilot means which is adapted to be connected with said compressed air supply passage means when said rod means is in the retracted position so as to shift said valve means from said second position to said first position and second pilot means which is adapted to be connected with said cylinder means to receive compressed air therefrom when said rod means is in the advanced position to shift the valve means from said first position to said second position.

4,419,936

BALLISTIC PROJECTILE

Arthur D. Coates; William F. Donovan; John A. Rakaczky, all of Harford City, Md., and Wayman E. Scott, Knoxville, Tenn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 139,372, Apr. 11, 1980, Pat. No. 4,383,485.
This application Aug. 16, 1982, Ser. No. 408,317
Int. Cl.³ F42B *11/24*
U.S. Cl. 102—364 1 Claim



1. A hermetically sealed ballistic projectile comprising:

a nose member having a rearwardly increasing diameter and a rearward region of decreased diameter, a rearward surface, and an axial countersunk-bore therethrough which includes;

a kinetic energy penetrator axially disposed in said countersunk-bore and protruding from said nose member to form a leading point of impact of said projectile;

a shell member a rearward inner surface and interior space, a forward most region having an inner surface of mating diameter with said nose member rearward region of de-

creased diameter and being in fixed but frangible contact with said nose member which includes an exterior steel case which is helically scored when it travels through a gun barrel and fragments in longitudinal strips upon impact;

a piston member having a forward most surface proximate the rearward surface of said of said nose member, said piston member being in hermetically sealed engagement with the inner surface of the forward most region of said shell member; and

a hypergolic fluid filling the interior space of said shell member between said rearward surface of said piston member and the rearward inner surface of said shell;

whereby on impact of said projectile with a target said kinetic energy penetrator penetrates said target and said nose member moves rearwardly fracturing said shell along said indentations and forces said piston member rearwardly causing said hypergolic fluid to be spewed in a helical pattern in the immediate vicinity of the target.

4,419,937

MAGNET SUPPORTING FRAME FOR A MAGNETICALLY LEVITATED VEHICLE

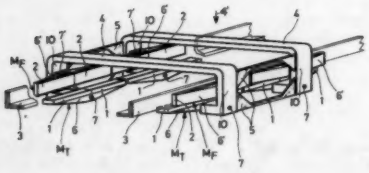
Guenter Steinmetz, Bruckmuehl; Ulf Steenbeck, Putzbrunn, and Dieter Reismayr, Oberhaching, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 284,701

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1980, 3033448

Int. Cl.³ B61B *13/08*

U.S. Cl. 104—281 **9 Claims**



1. A magnet supporting frame for a magnetically levitated vehicle movable on a rail structure defining a longitudinal direction, comprising at least two bending crossbeams (4) so constructed and arranged that their resistance against a substantially vertically effective bending load is minimal, whereby said bending crossbeams are flexible by said bending loads, said bending beams extending across the longitudinal direction of the rail structure, a plurality of connecting brackets (5) stiff against shearing loads and extending in parallel to said longitudinal direction interconnecting said at least two bending crossbeams (4) for forming said frame, levitating magnet means (1), first see-saw support means (6') for said levitating magnet means (1) including first pivot means (7) for tiltably securing said levitating magnet means to said bending crossbeams, guide magnet means (2), second see-saw support means (6') for said guide magnet means (2) including second pivot means (7') for tiltably securing said guide magnet means also to said bending crossbeams (4) so that each of said magnet means is tiltable in the direction of its respective magnetic force about an axis parallel to its pitch axis, whereby the magnet means are arranged in rows on both sides of a central plane extending vertically and centrally in said longitudinal direction, said rows extending symmetrically relative to said central plane.

4,419,938

PLUG-ASSEMBLED SECTIONAL DISPLAY RACK

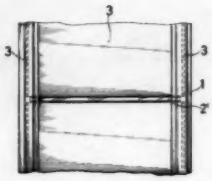
Albin Kaut, Blankensteinstrasse 26, D-7141 Steinheim/Murr, Fed. Rep. of Germany

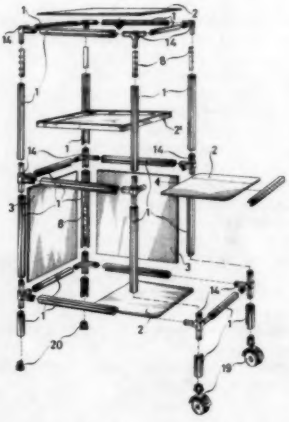
Filed Dec. 4, 1981, Ser. No. 327,479

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046139

Int. Cl.³ A47B *3/00*

U.S. Cl. 108—111 **10 Claims**



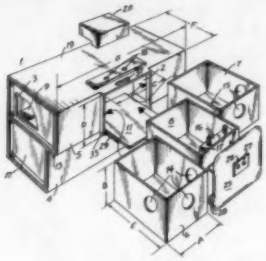


1. In a plug-assembled sectional rack suitable for display purposes and for use as a selling aid, store decoration, exhibition stand and the like, having hollow sections arranged vertically and horizontally to form, by means of corner junctions having plug connections, frames adapted to receive shelves for exhibiting items and/or vertical panels for multilaterally confining individual display cases within the rack, each of said hollow sections including a longitudinal recess defined by angular walls and a hollow longitudinal guide merging with the recess for accommodating said shelves and said vertical panels, the improvement comprising shelf supports having base portions provided with guide elements for insertion into said hollow longitudinal guides of the hollow sections whereby said shelf supports extend into said recesses, said base portions having upper faces serving as support surfaces for said shelves and having lateral faces for engaging said vertical panels, each said shelf support base portion being shaped such that there are slots between its lateral faces and the walls of said recesses for insertion of the vertical panels.

4,419,939
CONCEALED SAFE

Tomas M. Reverte, Calle Pedraforca 6,, Sant Cugat del Valles, (Barcelona), Spain

Filed Feb. 17, 1981, Ser. No. 235,145
Claims priority, application Spain, Dec. 6, 1980, 497,533
Int. Cl.³ E05G 1/06; A47B 97/00
U.S. Cl. 109—54 35 Claims



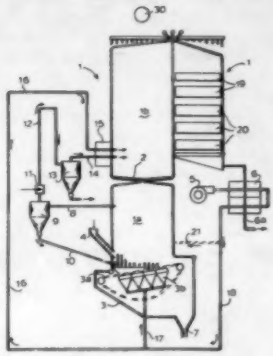
1. A concealed safe, comprising a hollow body having a front wall, a rear wall and two opposite lateral walls and formed with an internal chamber horizontally extending between said lateral walls, said chamber including an upper compartment of substantially parallelepipedal shape and a lower compartment of substantially parallelepipedal shape, said front wall being formed with an access front opening; a first lateral removably-insertable drawer; a second lateral removably-insertable drawer; a central removably-insertable door-drawer, said drawers being adapted to be introduced into said upper compartment through said front opening in turn one after another such that the first lateral drawer is introduced through said opening and shifted in said upper compartment towards one of said lateral walls to free said front opening, then the second lateral drawer is introduced through said opening and shifted in said upper compartment to another of said lateral walls to free said opening and afterwards said central door-drawer is introduced into said upper compartment through said front opening so that all said drawers are fitted in said upper compartment in the insertable position, said drawers being adapted to be extracted from said upper compartment also in turn through said opening; a removable tray positioned between said upper compartment and said lower compartment for supporting said drawers during their introduction into said upper compartment through said opening, said tray being slidably displaced to and from said front opening; an attachable plug socket adapted to be positioned against said front opening to close the latter or to be moved from said front opening to release the latter; and locking means for locking said plug socket operated from the exterior of said body.

4,419,940
BOILER INSTALLATION

Paul Cosar, Paris, and Raoul Teraube, Beauchamps, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed Nov. 16, 1982, Ser. No. 442,143
Claims priority, application France, Nov. 25, 1981, 81 22023
Int. Cl.³ F23G 5/00
U.S. Cl. 110—229 11 Claims

1. A boiler installation comprising
(a) a hearth for burning and thereby gasifying a solid fuel, the hearth including
(1) a grid supporting a fluidized bed of the solid fuel spread thereover, and
(2) means for blowing primary combustion air through the grid from below;
(b) a tubular boiler body superimposed on, and integral with, the hearth, the boiler body including
(1) a lower portion receiving the gasified fuel from the hearth,
(2) an upper portion,
(3) a common transverse wall dividing the tubular boiler body into the lower and upper portions, and
(4) a burner extending into the upper boiler body portion

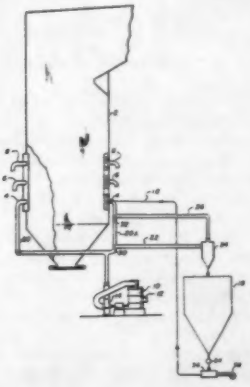


near the dividing transverse wall and receiving a supply of secondary combustion air;
(c) conduit means connecting the lower boiler body portion to the burner for feeding the gasified fuel therefrom to the burner; and
(d) dust removing and desulfurization means in the conduit means for removing dust and sulfur from the gasified fuel.

4,419,941
SUPPLYING PULVERIZED COAL TO A COAL-FIRED FURNACE

Richard W. Santalla, Enfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

PCT No. PCT/US82/01193, § 371 Date Oct. 13, 1982, § 102(e) Date Oct. 13, 1982
PCT Filed Sep. 2, 1982, Ser. No. 437,428
Int. Cl.³ F23K 1/00
U.S. Cl. 110—232 3 Claims



1. In a pulverized coal-fired steam generator having a direct-fired furnace, at least two burners for burning pulverized coal in the furnace, a load-carrying pulverizer for pulverizing the coal to be supplied to the furnace, and a plurality of conduits, one conduit per burner, interconnected between the burners

and the pulverizer, each conduit conveying a coal/air stream consisting essentially of a dilute phase pulverized coal and air mixture from the pulverizer to its associated burner, an apparatus comprising:

a. a separator for separating pulverized coal from air;

b. a diversion conduit interconnected between the separator and a first of the plurality of conduits interconnected between the burners and the pulverizer;

c. valve means disposed at the interconnection of said diversion conduit with the first of the plurality of conduits for selectively diverting the coal/air stream flowing therethrough into said diversion conduit;

d. a return conduit interconnecting said separator with the first of the plurality of conduits at a location downstream of said valve means for venting the air removed from the coal/air stream in said stream in said separator to the furnace;

e. a storage bin; and

f. means for conveying the pulverized coal removed from the coal/air stream in said separator to the storage bin.

4,419,942

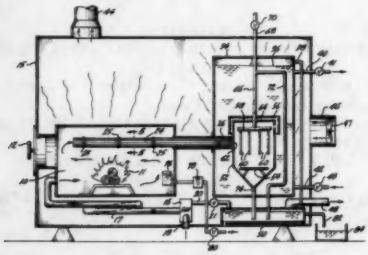
STOVE

Charles A. Johnson, E. 160 Luczs Creek Rd., Belfair, Wash. 98528

Filed Jul. 26, 1982, Ser. No. 401,946

Int. Cl.³ F23B 7/00

U.S. Cl. 110—234 **14 Claims**



1. A stove for the combustion of wood, coal or other fuels comprising:

a primary combustion zone having a fuel inlet, an air inlet and a combustion gas outlet;

a secondary combustion zone comprising an elongated bundle of tubes extending at least a portion of their length into said primary combustion zone and adapted to conduct combustion gases from said primary combustion zone and continue the combustion thereof;

a tertiary combustion and condensation zone communicating with said secondary combustion zone, said tertiary combustion and condensation zone being surrounded by a heat exchange medium to remove heat therefrom and condense water and other condensables while cooling said combustion gases;

means to conduct combustion gases from said tertiary combustion and condensation zone through conduits in heat exchange contact with said heat exchange medium and then to the atmosphere after removal of heat therefrom; and,

means to conduct said water and other condensable from said tertiary combustion and condensation chamber into a collection vessel.

4,419,943

INCINERATOR FOR CHEMICAL WASTE MATERIAL STORED IN BARRELS

Bent Faurholdt, Hojvaenget 8, Helsingor DK-3000, Denmark

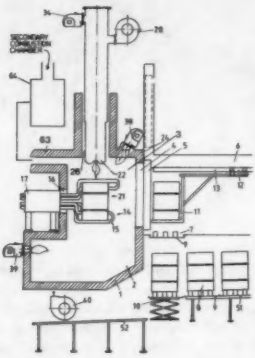
PCT No. PCT/DK81/00095, § 371 Date Jun. 9, 1982, § 102(e) Date Jun. 9, 1982, PCT Pub. No. WO82/01581, PCT Pub. Date May 13, 1982

PCT Filed Oct. 28, 1981, Ser. No. 387,872

Claims priority, application Denmark, Oct. 29, 1980, 4590/80

Int. Cl.³ F23G 7/00

U.S. Cl. 110—237 **4 Claims**



1. Incinerator for chemical waste material stored in barrels, comprising a primary combustion chamber with an outlet connected to a secondary combustion chamber, characterized in that said primary combustion chamber has a bottom section suitable for the combustion of solid waste material and a top section provided with a lateral port with a sluice closure and associated means for introducing a barrel through said port into said top section and withdrawing it therefrom, a barrel holder being provided in said top section in level with said lateral port, said barrel holder being adapted to receive and hold a barrel introduced through said port and being mounted for rotation about a horizontal axis for the purpose of turning a barrel held by it from upright to fully or partly inverted position and vice versa, burners and air injection means being provided for supplying flame heat and air both to the bottom section of the primary combustion chamber and to the interior of a barrel standing upright in the barrel holder.

4,419,944

MULTIPLE STROKE LOOPER MECHANISM FOR STITCHING MACHINE

William E. Passons, 3782 Kings Road, Chattanooga, Tenn. 37416; Joseph L. Card, and Roy T. Card, both of P.O. Box 24, Hixson, Tenn. 37343

Filed Nov. 9, 1981, Ser. No. 319,213

Int. Cl.³ D05C 15/00

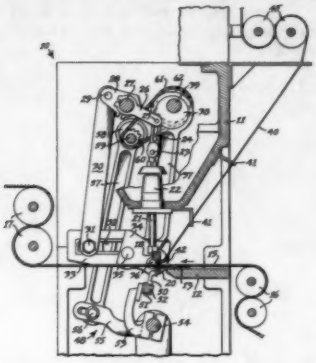
U.S. Cl. 112—79 R **13 Claims**

1. In a machine forming stitches in a base fabric, including means supporting a base fabric for longitudinal movement in a fabric plane through the machine, a needle bar on one side of the fabric plane, at least one needle mounted on the needle bar and adapted to carry a yarn through the base fabric, needle drive means for reciprocally moving the needle bar toward and away from the fabric plane to move the needle in a needle path through the base fabric in a plurality of reciprocal needle strokes, each needle stroke constituting a stitch cycle, and means supplying yarn to the needle, a looper mechanism comprising:

(a) a looper hook for each needle on the opposite side of the fabric plane from its corresponding needle and pointing in

the direction opposite to the direction of the movement of the base fabric, and

(b) looper drive means for reciprocally moving said looper hook across and proximate to the corresponding needle



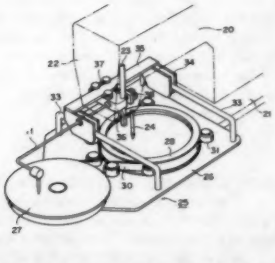
path for periodic seizure of a loop of yarn carried by a corresponding needle in a plurality of reciprocal looper strokes, the number of said looper strokes being a multiple of each needle stroke in a stitch cycle.

4,419,945

EMBROIDERING APPARATUS FOR USE WITH SEWING MACHINES

Mitsuo Nishina, Nagano, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan

Filed Nov. 20, 1981, Ser. No. 323,453
Int. Cl.³ D05C 9/04
U.S. Cl. 112—103 **17 Claims**



1. An embroidering apparatus for use with a sewing machine having a needle provided at a predetermined position, comprising:

a table movably supported in a plane including at least two intersecting directions on which an original pattern is to be placed,

an embroidery frame associated with said needle of said sewing machine, means connecting said frame to said table for movement therewith in the direction corresponding to the movement of said table responsive thereto, and

a tracing needle having the tip end thereof positioned at a fixed position and said tip end oriented to said original pattern on said table.

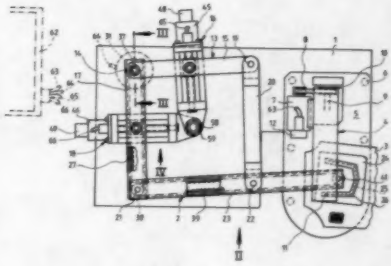
17. An embroidering apparatus for use with a sewing machine, comprising a pair of guide rails extending perpendicularly to each other, an embroidery frame movable back and forth and laterally along said guide rails, a table operatively connected to said embroidery frame and manually actuatable for timed movement with the embroidery frame, a tracing needle oriented to said table on which an original pattern is to be placed, and means operatively connecting said tracing needle to said embroidery frame in fixed relationship therewith whereby movement of said tracing needle along said pattern correspondingly shifts said embroidery frame with respect to the needle of the sewing machine.

4,419,946

FEEDING DEVICE FOR AN AUTOMATIC SEWING ARRANGEMENT

Jochen Fischer, Detmold, and Hans Scholl, Oerlinghausen-Lipperreihe, both of Fed. Rep. of Germany, assignors to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,596
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3136953
Int. Cl.³ D05B 21/00, 27/00
U.S. Cl. 112—121.12 **12 Claims**



1. A sewing machine for producing a stitch contour in a workpiece according to a predetermined program, comprising:

a stand;

a sewing head including a drive motor and received by said stand, and having stitch forming means including a needle;

workpiece receiving means movably arranged in a sewing plane with respect to said needle;

at least one axis located at said stand in a perpendicular extension to said sewing plane, and

link means extending in parallel to said plane, including:

a first drive lever pivoted at one end at said axis;

a second drive lever pivoted at one end at said axis;

an intermediate lever jointly connected with one end to the free end of one of said levers;

a drive-off lever jointly connected by link means to the free end of one of said drive levers and to the other end of said intermediate lever and receiving said workpiece receiving means;

propelling means acting upon said drive levers; and

programmable control means coordinatingly controlling said propelling means and said drive motor,

said propelling means comprising:

a first driving device including a first motor driving said first drive lever; and

a second driving device including a second motor driving said second drive lever.

4,419,947

ELECTRONIC SEWING MACHINE

Hachiro Makabe, Kanagawa; Muneaki Hagiwara, Koganei, and Haruhiko Tanaka, Mitaka, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1981, Ser. No. 294,171
Claims priority, application Japan, Aug. 29, 1980, 55-118282
Int. Cl.³ D05B 3/02
U.S. Cl. 112—158 E **3 Claims**

1. A sewing machine having a rotatable shaft means for

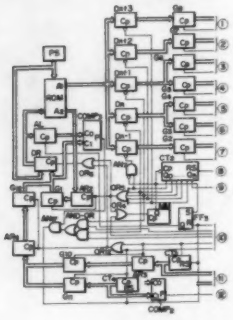
operating a stitch forming device and including feed dog means for feeding a fabric to be sewn and a needle for forming stitches in the fabric, the machine comprising:

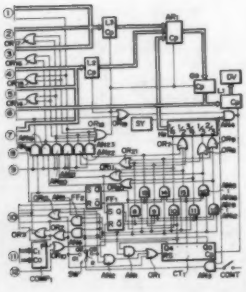
(a) first electronic memory means (ROM) for storing stitch control data, said first memory means including at least the needle position control data for different positions;

(b) pattern selecting means for reading out from said first memory said stitch control data for a selected pattern;

(c) timing means (SY) operated synchronously with said shaft means to produce a timing signal for progressively reading out said stitch control data from said first memory;

(d) stitch mode changing switch means (SW) selectively operated to determine an elongation rate of a selected pattern to be elongated in a feeding direction;





(e) second memory means (Dn−1 to Dn+3) for temporarily storing designated stitch control data of said first memory means;

(f) counter means (CT1, CT2) for counting the ordinals of stitches of a selected pattern in relation to a timing signal of the timing means and in accordance with said pattern elongation rate determined by the stitch mode changing means, to thereby designate the pattern elongation rate and the stitch control data to be stored in said second memory means progressively during formation of the stitches of said pattern; and

(g) calculating means (AR1,Ke) operable with respect to an output of said counter means to make a calculation to produce different stitches between the stitches which are formed by the stitch control data stored in the second memory means.

4,419,948

NEEDLE BAR LUBRICANT SEALING DEVICE

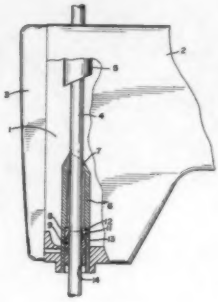
Wolf R. von Hagen, Hemmingen, Fed. Rep. of Germany, assignor to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany

Filed May 10, 1982, Ser. No. 376,313

Claims priority, application Fed. Rep. of Germany, May 16, 1981, 31195679

Int. Cl.³ D05B *71/00*

U.S. Cl. 112—256 **7 Claims**



1. A sewing machine comprising:

a frame;

a bearing secured in the frame;

a lubricated needle bar endwise reciprocally mounted in said bearing for movement along a generally vertical linear path;

means for removing excess lubricant from the peripheral surface of said needle bar, said means comprising first and second scraping edges arranged in surrounding engagement with said needle bar both of which are formed by an upper edge of a truncated conical surface which tapers downwardly and away from the straight line path of the needle bar, said first scraping edge being situated at one extremity of said bearing and the second scraping edge being situated intermediate the first scraping edge and the opposite extremity of said bearing, and a radial part formed in said bearing in communication with one of said scraping edges.

4,419,949

FABRIC ALIGNING METHOD AND APPARATUS

Thomas P. Goodman, Palatine; Chieh-Kung Yin, Hawthorn Woods, and Robert L. Kosrow, Hoffman Estates, all of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed May 11, 1981, Ser. No. 262,271

Int. Cl.³ D05B *97/00, 35/10*

U.S. Cl. 112—262.1 **11 Claims**

1. A method for positioning in a predetermined location a series of edges of fabric panels comprising the steps of:

generating the analog value of a photocell array means through a multiplexer and A/D converter when no portion of the photocell array means, which includes of a series of individual sensor unit means that comprises energy transmitter means and receptor means, is covered whereby an uninterrupted energy value is determined and recorded;

positioning a portion of the fabric panels between the energy transmitter means and receptor means of the photocell array means, tensioning said fabric panels causing the photocell array to be moved along a length of said fabric panels;

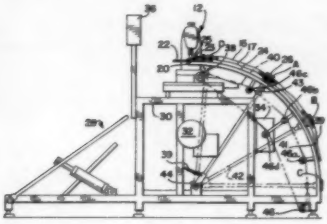
re-establishing the analog value of said photocell array through said multiplexer and A/D converter means when the transmission of energy between the transmitter means

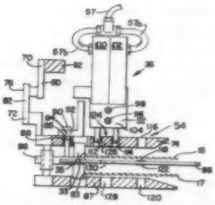
and receptor means of each sensor is interrupted by the presence of the fabric in combination with said uninterrupted energy value and recording that value;

detecting the trailing fabric edge of the shorter fabric ply;

causing a portion of said photocell array to run off said trailing fabric edge whereby terminating the interruption caused by the presence of said portion of fabric panel means with respect to some of said individual sensor means;

clamping the fabric ply means;





reading the amount of energy received by each receptor of said individual sensor unit means, generating analog values thereof and recording same values;

relaxing tension on the fabric panel means; scanning said photocell array, generating analog values while comparing said values to said three previously recorded analog values and simultaneously reorientating said trailing fabric edge, after each reorientation generating and comparing the analog values and; securing said fabric panel means when a particular pattern of analog values is detected; and

starting a work sewing cycle on said fabric panel means.

4,419,950

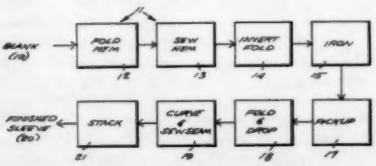
HOT WIRE CUTTER FOR AUTOMATIC SLEEVE MAKING MACHINE

John H. Keeton, P.O. Box 296, Campbellsville, Ky. 42718

Division of Ser. No. 319,671, Nov. 9, 1981, Pat. No. 4,404,946. This application Mar. 4, 1982, Ser. No. 354,797

Int. Cl.³ D05B *65/00*

U.S. Cl. 112—290 **1 Claim**



1. A hot wire cutter assembly associated with an automatic sewing machine stitching with synthetic thread, and comprising:

a guide block mounted at the rear of said automatic sewing machine, and having a ramp portion formed therewith;

an electric resistance heating coil mounted within a cut out formed in said guide block, and in operative association with said ramp; and

said guide block and said coil positioned with respect to each other and said automatic sewing machine so that a piece of fabric being stitched by said automatic sewing machine after exiting said automatic sewing machine automatically passes over said ramp, and the synthetic thread providing said stitching is cut and a nub thereof is fused so that the ultimately remaining nub is of small size.

4,419,951

FEEDER DEVICE FOR A SEWING MACHINE

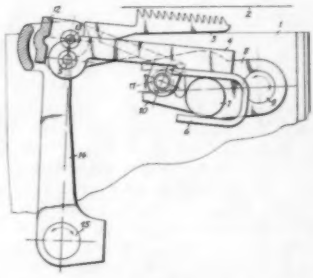
Urs Ruch, Berlingen, and Ernst Dreier, Steckborn, both of Switzerland, assignors to Fritz Gegauf Aktiengesellschaft Bernina-Nähmaschinenfabrik, Steckborn, Switzerland

Filed Nov. 18, 1980, Ser. No. 207,783

Claims priority, application Switzerland, Dec. 3, 1979, 10730/79

Int. Cl.³ D05B *27/02*

U.S. Cl. 112—323 **3 Claims**



1. A feeder device for a sewing machine having a stitch plate comprising:

a material feeder being operatively mounted below said stitch plate and being driven to selectively project through an opening in said stitch plate;

a lift rocker;

a follower pin operatively connected to said lift rocker;

a lift rocker shaft, said lift rocker being operatively connected to said lift rocker shaft;

a thrust rocker;

a thrust rocker shaft, said thrust rocker being operatively connected to said thrust rocker shaft;

an intermediate rocker, said intermediate rocker being operatively connected between said thrust rocker and said lift rocker;

a support;

a guide fork operatively connected to said support;

a support axis;

said follower pin being in engaging relationship with said guide fork and said support being connected to said material feeder and being operatively connected to said support axis, said support axis being mounted on said intermediate rocker at a distance nearly vertically below an axis connecting the intermediate rocker with the thrust rocker;

wherein movement of said lift rocker imparts motion to said material feeder which is constrained to move in substantially horizontal and vertical directions to form an approximate rectangle in an effective area of movement due to the interconnection of the thrust rocker, the intermediate rocker, the lift rocker and the support to project said

material feeder through said opening in said stitch plate in a first vertical and a first horizontal direction and to retract said material feeder through said opening in said stitch plate in a retracted vertical direction and a retracted horizontal direction.

4,419,952

TEMPERATURE INDICATING DEVICE ON TRAFFIC SURFACES

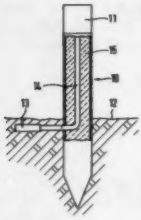
Wolfgang Weiler, Am Römerbrunnen 21, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 9, 1981, Ser. No. 233,075

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 3003408

Int. Cl.³ G01K *11/16, 13/00*

U.S. Cl. 116—216 **5 Claims**



1. An apparatus for detecting and for optically indicating from afar only two different temperature conditions of an upper layer of a road surface, said apparatus comprising:

metal thermally conductive temperature sensor means, adapted to be positioned within an upper layer of a road surface, for sensing the temperature thereof;

a temperature indicator adapted to be positioned at a location above the road surface and at the edge of the road, said indicator including a liquid crystal agent having only a first optically perceivable condition substantially at a temperature above the freezing point of water and a second optically perceivable condition substantially at a temperature below the freezing point of water, said liquid crystal agent, depending on the temperature thereof, being changeable only between said first and second optically perceivable conditions; and

a metal thermally conductive connecting means for thermally connecting said temperature sensor means and said liquid crystal agent, for thereby conveying the temperature sensed by said sensor means to said liquid crystal agent, and for thereby causing said liquid crystal agent to exhibit the respective said condition representative of said sensed temperature.

4,419,953

APPARATUS FOR APPLYING SEASONING

David P. Fowler, Irving, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Jun. 8, 1982, Ser. No. 386,350

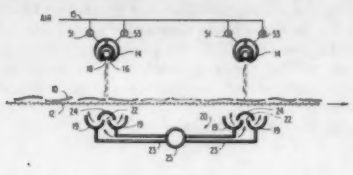
Int. Cl.³ B05C *19/00*

U.S. Cl. 118—16 **13 Claims**

1. A seasoning distributor apparatus for controllably distributing seasoning falling onto a snack product comprising:

opposite wall means defining a seasoning outlet therebetween and through which seasoning is discharged to fall onto the snack product,

means for directing at least two streams of air along the respective opposite wall means toward the seasoning outlet to meet the falling seasoning below the seasoning outlet and above the snack products, and



means for controlling the streams of air to control and modify the distribution of the seasoning falling from the seasoning outlet.

4,419,954

DEVICE FOR APPLYING A COATING TO A SURFACE SUBMERGED IN A LIQUID

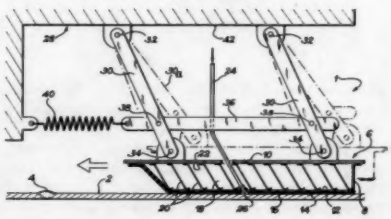
Raymond Galinou, Veigne, France, assignor to Commissariat a l'Energie Atomique and Centre National pour l'Exploitation des Oceans, both of Paris, France

Filed May 17, 1982, Ser. No. 378,788

Claims priority, application France, May 22, 1981, 81 10224

Int. Cl.³ B05C *1/02*

U.S. Cl. 118—207 **3 Claims**



1. A device for applying a coating to a surface submerged in a liquid comprising, at least one applicator moving along the surface to be painted and constituted by a pad having a support plate and a tight deformable envelope, the plate and the envelope having in each case an inner face and an outer face, the latter being in contact with the liquid in which the surface to be painted is submerged, the envelope being provided on its outer face with flexible fibres or bristles for rubbing on said surface, the support plate and deformable envelope defining a space within the pad, the latter being associated with a rigid support co-operating with means making it possible to exert a given pressure on the surface, wherein the space within the pad is tight to the liquid in which the surface to be painted is submerged and is equipped with elastic means making it possible to locally deform the envelope, and wherein the said means making it possible to exert a given pressure on the surface comprise a deformable system connecting the pad to the rigid support in order that the relative position of support and pad can vary, whilst the latter remains applied against the surface to be painted, the elastic means permitting the local deformation of the envelope of the pad comprising springs, whereof one end of each spring is fixed to the inner face of the plate, the other end thereof exerting a pressure on the inner face of the envelope.

4,419,955

SYNCHRONIZED DRIVE MECHANISM FOR A LOADER AND A DESTACKER OF A PRESS

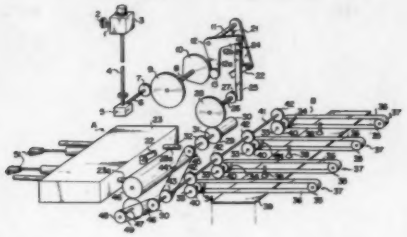
Kiyokazu Baba, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,337

Claims priority, application Japan, Oct. 12, 1981, 56-150016[U]; Oct. 12, 1981, 56-150017[U]

Int. Cl.³ B05C 1/02

U.S. Cl. 118—227 5 Claims



1. A synchronized drive mechanism for a loader and a destacker of a press including drive means, comprising:

a first shaft connected to and rotated by said drive means;

means for translating rotary motion of said first shaft into a linear reciprocating motion and a swing motion;

first connecting means for connecting the swing motion side of said translating means with said loader;

said loader being adapted to move reciprocably in synchronism with a press stroke for feeding a blank material into the press;

means for converting the linear reciprocating motion of said translating means into an intermittent one way rotary motion;

conveyor means of said destacker for conveying the blank material to said loader; and

second connecting means for connecting the intermittent one way rotary motion of said converting means with said conveyor means whereby said conveyor means is rotated intermittently in one way in synchronism with the reciprocating motion of said loader for conveying the blank material to said loader.

5. A synchronized drive mechanism as recited in claim 1 further comprising a pair of roller means arranged between said destacker and said loader for coating oil onto the blank material passing therethrough and third connecting means for connecting the intermittent one way rotary motion of said converting means with one of said roller means whereby both said roller means are rotated intermittently in opposite directions from each other in synchronism with the reciprocating motion of said loader for feeding the blank material from said destacker to said loader.

4,419,956

INKING MACHINES

Jim Kwok-Fai, 20 Pennington St., 3rd Floor, Hong Kong, Hong Kong

Continuation-in-part of Ser. No. 246,691, Apr. 16, 1981, abandoned. This application May 14, 1982, Ser. No. 378,339

Int. Cl.³ B05C 1/00

U.S. Cl. 118—235 9 Claims

1. A machine for inking typewriter ribbons and the like comprising:

a support;

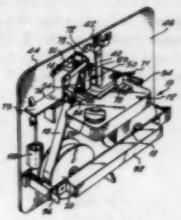
an air-tight ink reservoir carried by said support;

an ink inlet to said reservoir capable of being sealed tight once ink has been added;

an inking roller carried by said support and having a cylindrical surface to which ink is delivered from said reservoir;

means for moving a ribbon to be inked over said inking roller to transfer ink from said cylindrical surface onto said ribbon;

an outlet from said reservoir immediately adjacent said cylindrical surface through which ink passes into contact with part of said cylindrical surface, the outlet being on the same side of said reservoir as the inlet so that ink cannot flow out of the outlet under gravity until said support has been inverted to invert said reservoir after it has been filled and said inlet sealed;



air inlet means to said reservoir; and

means carried by said support and actuated by contact with a supporting surface on which said support stands for opening said air inlet when said support and said reservoir have been inverted and stood on said supporting surface whereby a ribbon can then be inked by a flow of ink out from the reservoir through the outlet into contact with said cylindrical surface.

4,419,957

ADHESIVE COATING APPARATUS FOR COATING SHEET-LIKE MATERIALS

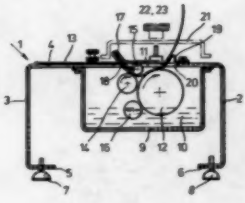
Wolfgang Voges, Erlangen, Fed. Rep. of Germany, assignor to Claus Koenig KG, Erlangen, Fed. Rep. of Germany

Filed Nov. 12, 1980, Ser. No. 206,290

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027564

Int. Cl.³ B05C 1/02

U.S. Cl. 118—245 7 Claims



1. An apparatus for coating sheet-like material with adhesive comprising:

a housing having a generally horizontal cover plate and a material inlet/outlet opening in said cover plate through which sheet material enters said housing uncoated and exits said housing after being coated with adhesive;

an adhesive trough disposed within and sealingly connected to said housing, said trough being located below said cover plate and under said opening; and

coating means disposed within said housing located substantially completely below said cover plate and over said trough, for drawing sheet material along said cover plate and downwardly into said housing through said opening, drawing adhesive from said trough and applying it to said

sheet material, and expelling coated sheet material from said housing upwardly through said opening,

wherein adhesive dripping from said coating means will fall away from said opening into said trough, and said opening can be sealed when said coating apparatus is not in use by a substantially flat cover which extends over said opening and sealingly engages said cover plate to prevent the escape of vapors from said housing.

4,419,958

NOZZLE FOR COATING OPTICAL FIBERS

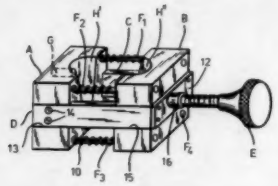
Giacomo Roba, Cogoleto, Italy, assignor to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A., Torino, Italy

Filed Dec. 17, 1981, Ser. No. 331,920

Claims priority, application Italy, Dec. 19, 1980, 68946 A/80

Int. Cl.³ B05C *3/12, 11/02*

U.S. Cl. 118—405 **4 Claims**



1. A nozzle for applying a protective resin coating to optical fibers, comprising a body essentially consisting of aluminum with a throughgoing passage which forms a frustoconical funnel terminating at its smaller end in a converging outlet port coaxial therewith, at least the wall surface of said outlet port being provided with an alumina layer unitary with said body and substantially free from open pores.

4,419,959

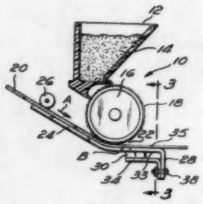
MAGNETIC TONER RETAINER MEANS

Virgil W. Westdale, Barrington, Ill., assignor to AM International, Inc., Chicago, Ill.

Filed Sep. 29, 1982, Ser. No. 427,152

Int. Cl.³ G03G *21/00*

U.S. Cl. 118—657 **6 Claims**



1. A magnetic toner system, having a development zone, including:

a magnetic developer roller brush in said development zone;

a hopper for dispensing magnetic toner to said roller brush;

non-magnetic guide means supporting a master sheet for development adjacent the surface of said roller brush;

means transporting said sheet through said development zone; and

magnet means in the development zone for restraining any toner on the bottom of said sheet from being carried out of said development zone as said sheet is transported therethrough, said magnet means having a field strength that is weaker than the field strength of said magnetic roller brush.

4,419,960

DEVELOPING AGENT DENSITY CONTROLLING DEVICE

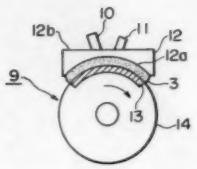
Akio Okamura; Shuji Tanaka, and Tamotsu Sakamoto, all of Eibna, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1982, Ser. No. 415,621

Claims priority, application Japan, Sep. 8, 1981, 56-140253

Int. Cl.³ B05C *11/00*; G03G *15/00*

U.S. Cl. 118—712 **8 Claims**



1. A developing agent toner density controlling device, comprising;

means disposed in the flow path of a developing agent and including a permanent magnet for forming a magnetic brush of developing agent;

electrically conductive means confronting said permanent magnet for forming a toner image thereon by contacting said magnetic brush; and

means for detecting the amount of toner in said image formed on a surface of said electrically conductive means, to control an amount of toner supplied to said developing agent.

4,419,961

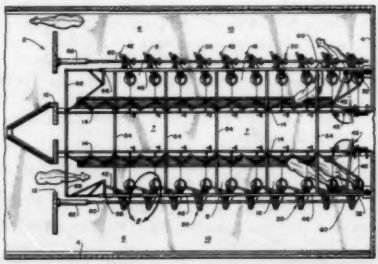
MILKING PARLOR CONSTRUCTION

August Vandenberg; Ben W. Vandenberg, both of 17226 Roseton Ave., Artesia, Calif. 90701; Andrew W. Vandenberg, 15751 Ryon St., and Ben E. Haws, 8828 Laurel St., both of Bellflower, Calif. 90706

Filed Apr. 16, 1982, Ser. No. 369,030

Int. Cl.³ A01K *1/12*

U.S. Cl. 119—14.03 **15 Claims**



1. Milking parlor construction comprising the combination: a module comprising a hollow vertical upright member adapted for rigid securement in a base or the like; a feed bowl means secured to said hollow vertical upright member and defining a cattle feeding station; a gate member pivotally mounted on said hollow vertical upright member and being adapted to move between an open position and a closed position; a feed conveyor means superpositioned in stationary position to said hollow vertical upright member and adapted to

deliver feed to said hollow vertical upright member defining a feed passageway having communication to said feel bowl means; and means to move said gate member into a selected one of the open and closed positions.

4,419,962

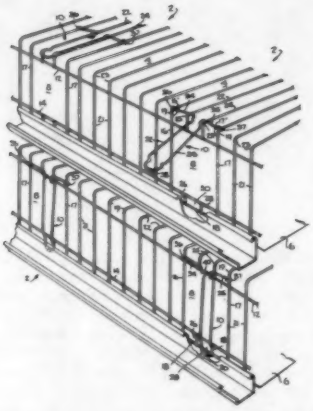
DOOR CONSTRUCTION FOR POULTRY CAGE

Anthony J. Siciliano, South Lyon, Mich., assignor to Diamond Automations, Inc., Farmington, Mich.

Filed Mar. 29, 1982, Ser. No. 362,602

Int. Cl.³ A01K *31/10*

U.S. Cl. 119—17 **11 Claims**



1. A cage door construction comprising:

a cage front and a cage top, the cage front including left and right lateral wires and upper and lower transverse wires which intersect the upper and lower lateral wires to form a doorway;

a pair of guide wires extending upwards from the upper transverse wire and bent over to form part of the cage top; and

a flexible door for closing the doorway, the door including an elongated main part arranged in a first plane, a lower part bent out of the first plane to lie in a second plane which is substantially parallel to the first plane, and an upper part from which right and left arms extend laterally outwards, the elongated main part extending from the lower transverse wire to the upper transverse wire, the left and right arms each slidably engaged on the respective guide wire.

4,419,963

FEEDING RAILING

Weelink J. M. Willibrordus, No. 10, Brandersdijk,, 7136 KV Zieuwent, Netherlands

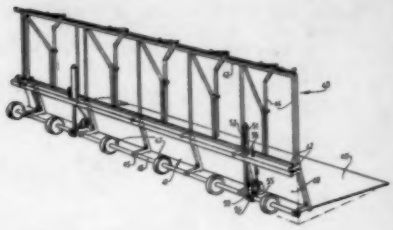
Filed Mar. 31, 1982, Ser. No. 363,953

Claims priority, application Netherlands, Mar. 31, 1981, 8101597

Int. Cl.³ A01K *5/00*

U.S. Cl. 119—51 R **13 Claims**

1. A feeding railing for animals comprising a frame, a plurality of vertical spikes fastened to said frame and adapted to extend pairwise behind the animal's head on both sides of the neck and being spaced apart by a distance which is larger than the width of the neck and smaller than the width of the withers of the animal and comprising at least one wheel supporting the frame so as to be movable along the ground, characterized in that the frame has connected with it a floor plate extending rearwardly over a given distance near the ground and by driving means comprising buffer means for the wheel for storing energy during the rotation of the or each wheel in one



direction and by releasable guard means for blocking the rotation in the other direction.

4,419,964

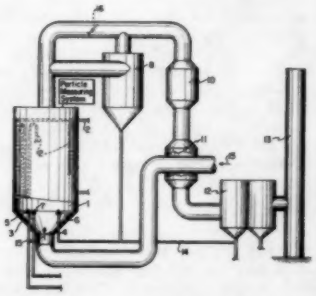
COMBUSTION PLANT

Torben Enkegaard, Copenhagen, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Continuation of Ser. No. 88,526, Oct. 26, 1979, abandoned. This application Jun. 28, 1982, Ser. No. 392,456

Int. Cl.³ F22B *1/00*

U.S. Cl. 122—4 D **19 Claims**

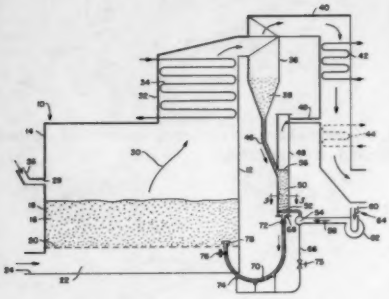


1. Whirl chamber boiler plant which comprises at least one combustion chamber having boiler tubes therein, the bottom portion of said chamber sloping generally downwardly from the walls thereof toward generally centrally positioned combustion air inlet means, means for directing fuel and inert material to the bottom portion of said chamber so that the combustion takes place in a whirl which moves upwardly and centrally in said chamber and also downwardly along the walls of said chamber, said inlet means being dimensioned so as to avoid blockage thereof by the inert material, outlet means at the upper portion of said chamber for exit gases and particle products of combustion, means for selectively returning to said chamber at least a first predetermined portion of the inert material from the gases exiting said outlet means of said chamber, and means for returning to said chamber at least a second predetermined portion of the separated ash in a relatively cold condition.

4,419,965
FLUIDIZED REINJECTION OF CARRYOVER IN A FLUIDIZED BED COMBUSTOR

Juan A. Garcia-Mallol, Morristown, and Michael G. Alliston, Newark, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Nov. 16, 1981, Ser. No. 321,518
Int. Cl.³ F22B 1/02
U.S. Cl. 122—4 D **10 Claims**



1. A fluidized bed combustion system comprising:
(a) a combustion chamber;
(b) means in said combustion chamber for supporting a bed of particulate material including a fuel material;
(c) means for providing and introducing air to said bed, to fluidize said particulate material and to promote the combustion of said fuel material;
(d) means for introducing fuel to said bed of particulate material;
(e) separating means in communication with said combustion chamber for separating said combustion gases from said fine particles;
(f) means in communication with said separating means for receiving said fine particles from said separating means and for supporting a bed of said fine particles;
(g) a header and a set of horizontally-extending sparger pipes having spaced apart holes in their lower sides for introducing air to said fine particles to fluidize said fine particles; and
(h) means for passing said fine particles in a fluidized state from said bed of fine particles to said bed of particulate material.

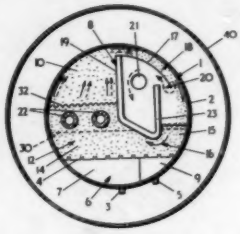
4,419,966
FLUIDIZED BED COMBUSTION

Francis J. Jenkins, and Michael J. Jenkins, both of Wolverhampton, England, assignors to EMS Thermplant Limited, Birmingham, England

Filed Feb. 23, 1982, Ser. No. 351,370
Claims priority, application United Kingdom, Feb. 27, 1981, 8106243
Int. Cl.³ F22B 1/02
U.S. Cl. 122—4 D **10 Claims**

1. A fluidized bed combustor including a horizontally elongate cylindrical body adapted to contain a fluidized bed of particulate material, a gas permeable support on which in use the bed is supported within the body, a plenum defined between the support and the base of the body, the plenum being divided into at least two parts, an exhaust outlet means at one end of the body, and a hollow elongate baffle extending within the body longitudinally thereof, the interior of the baffle communicating with the exhaust outlet means, a deflector located at a relatively upper part of the baffle and spaced from the defining wall of the body to provide passage means for the flow in use of gas and entrained bed particles from one side of the baffle to the other side thereof, an inlet means provided in the baffle at said relatively upper part adjacent a trailing portion of the deflector, the baffle being disposed within the body such that in use at least a lower part thereof extends into the bed of particulate material thereby to define at least two regions therein corresponding to the at least two parts of the plenum and the upper part thereof extends into the freeboard above the bed.

5. A method of operating a fluidized bed combustor comprising the steps of establishing a bed of particulate material in at least two regions of a hollow elongate baffle at least a lower part of which extends into the bed and an upper part thereof extends into the freeboard above the bed, fluidizing the regions

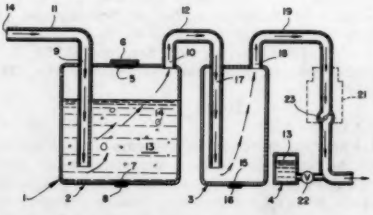


of the bed at different rates, causing gases and entrained bed particles to pass in the freeboard from one region of the bed around the baffle through passage means defined between a deflector located at a relatively upper part of the baffle and the defining wall of the body to the other region thereof, the gases passing into the baffle through inlet means adjacent a trailing portion of the deflector, the gases exhausting through an exhaust outlet means located at one end of the body and communicating with the interior of the baffle, the entrained bed particles being deposited in the other region of the bed fluidized at a relatively lower rate, and causing circulation of bed material between the regions of the bed.

4,419,967
METHOD AND APPARATUS FOR UTILIZING ETHANOL OF ANY PURITY AS A FUEL IN 4-STROKE INTERNAL COMBUSTION ENGINES

Alfredo C. Protacio, Project Sta. Barbara Sangley Point, Cavite City, Philippines; Ramon V. Navarro, Cavite City, Philippines; Eliseo M. Rio, Jr., Cavite City, Philippines; Antonio D. Alonte, Cavite City, Philippines, and Felix J. Pascual, Cavite City, Philippines, assignors to Alfredo C. Protacio, Cavite City, Philippines

Continuation of Ser. No. 153,696, Jun. 12, 1980, abandoned.
This application Sep. 30, 1982, Ser. No. 430,692
Claims priority, application Philippines, Jun. 14, 1979, 22666
Int. Cl.³ F02B 75/12
U.S. Cl. 123—1 A **3 Claims**



1. A method adapted to utilize non-anhydrous ethanol as a fuel in an internal combustion engine comprising the active steps of: aspirating air by means of vacuum pressure developed

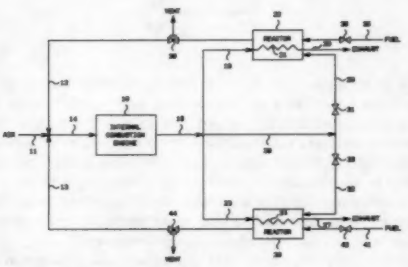
by piston displacement of an engine on an intake stroke, bubbling said air into liquid ethanol contained in a vaporizing container, said vaporizing container including an air inlet pipe extending downward inside said vaporizing container to close to the bottom thereof, an air outlet pipe in the cover of said container, passing said bubbled air through said vaporizing container's air outlet pipe into a liquid condensate tank, said vaporizing container's outlet pipe extending downwardly inside said liquid condensate tank to close to the bottom thereof; said liquid condensate tank further including an air outlet pipe in the cover of said tank, thereby evaporating ethanol in said vaporizer container and said condensate tank and mixing said air and ethanol vapors in order to produce a homogeneous air-fuel flammable mixture, and introducing said flammable mixture into said engine's intake manifold free from moisture and ethanol droplets.

4,419,968

METHOD AND APPARATUS FOR REMOVING HYDROGEN SULFIDE FROM FUEL FOR AN INTERNAL COMBUSTION ENGINE

Roy C. Lee, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 125,434, Feb. 28, 1980, Pat. No. 4,347,811.
This application Aug. 2, 1982, Ser. No. 403,977
Int. Cl.³ F02B *43/08*
U.S. Cl. 123—3 **6 Claims**



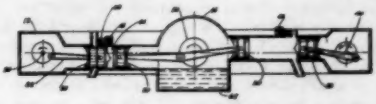
1. Apparatus comprising:
an internal combustion engine;
a first reactor;
a second reactor, each of said first and second reactors containing an absorbing composition capable of removing hydrogen sulfide from fuel for said internal combustion engine and capable of being regenerated in the presence of oxygen;
means for supplying a fuel for said internal combustion engine through said first reactor to said internal combustion engine, the fuel flowing through said first reactor contacting the absorbing composition contained in said first reactor;
means for supplying a fuel for said internal combustion engine through said second reactor to said internal combustion engine, the fuel flowing through said second reactor contacting the absorbing composition contained in said second reactor;
means for selectively supplying exhaust gases, which contain oxygen, from said internal combustion engine to said first and second reactors;
means for manipulating the flow of fuel to said first and second reactors;
means for manipulating the flow of said exhaust gases to said first and second reactors, the flow of fuel and the flow of said exhaust gases being manipulated in such a manner that if fuel is being supplied through said first reactor said exhaust gases are not supplied to said first reactor and said exhaust gases are supplied to said second reactor, and if fuel is being supplied to said second reactor said exhaust gases are not supplied to said second reactor and said exhaust gases are supplied to said first reactor, wherein the absorbing composition in said first and second reactors removes hydrogen sulfide from the fuel, and said exhaust gases regenerate the absorbing composition in said first and second reactors.

4,419,969

FLEXIBLE CYLINDER-HEAD INTERNAL COMBUSTION ENGINE WITH CYLINDER COMPRESSION ADJUSTABLE FOR USE WITH AVAILABLE FLUID FUELS

Benjamin Bandrick, Jr., Rte. 3, Box 272, Slidell, La. 70458

Division of Ser. No. 62,581, Jul. 31, 1979, Pat. No. 4,312,306.
This application Oct. 13, 1981, Ser. No. 311,103
Int. Cl.³ F02B *75/04, 75/36*
U.S. Cl. 123—48 R **2 Claims**



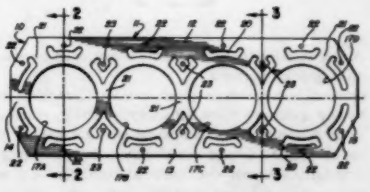
1. A flexible cylinder-head, piston type, internal combustion engine with spaced-apart cranks comprising:
(a) a pair of oppositely disposed cylinders, each having oppositely disposed ends, oppositely and equally offset from a line through the respective centers of said spaced apart cranks that are oppositely disposed from said cylinder ends;
(b) pistons respectively mounted in said cylinder ends;
(c) piston rods respectively connecting said pistons to the respectively nearest of said cranks;
(d) similar gears mounted on said cylinders and driven in rotation by said cranks, said gears being engaged for said cranks to rotate at same speed and in same direction in two cycle operation which pistons of each cylinder moving in opposed reciprocal action and alternate combustion; and
(e) mechanical means for manually disengaging and reengaging said gears, and changing the relative piston positions in said cylinders and thus cylinder compression between opposed pistons at closest proximity to an ignition compression of an available fluid fuel for the operation of said engine on said fuel.

4,419,970

CYLINDER BLOCK

Terrence M. Shaw, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Continuation of Ser. No. 104,096, Dec. 17, 1979, abandoned.
This application Feb. 9, 1982, Ser. No. 347,188
Int. Cl.³ F02F *1/36*
U.S. Cl. 123—41.74 **6 Claims**



1. A cylinder block for an internal combustion engine comprising a cooling jacket portion having walls and a floor section; a plurality of cylinder tubes of generally uniform thickness integral with said cooling jacket floor section and ar-

ranged in relatively spaced relation and extending at least in part upwardly into said cooling jacket from said floor section and below said floor section, each of said cylinder tubes substantially axially supported only by said jacket floor section and substantially isolated from each other tube and said cylinder block, upper ends of said tubes being generally coplanar with top edges of said cooling jacket walls and defining a top surface of the block; a plurality of first and second bores disposed within said cylinder block parallel to said cylinder tubes and adjacent a perimeter of and in outwardly spaced relation therefrom so that said cylinder tubes are isolated from said bores via the cooling jacket extending to the top surface of the block in regions located between said bores and said cylinder tubes, with said cylinder tubes being substantially entirely surrounded by coolant above said floor section, said bores being internally threaded within said block to threadably engage a corresponding number of cylinder head bolts; said first bores being in closer proximity to said jacket walls than said second bores, the internal threading of said second bores commencing at a level which is a greater distance from the top surface of said block than the level of commencement of the internal threading in said first bores, such that relative variations in axial cylinder tube deflection with respect to radial tube position that result from axial cylinder tube compression are minimized without any cylinder tube support other than that provided by said integral jacket floor section.

4,419,971

CYLINDER LINER FOR AN INTERNAL COMBUSTION ENGINE

Kiyoshi Nakamura; Katsutoshi Nishida, both of Yokohama; Toshihiko Ochiai, Yokosuka; Akio Ando, Kawasaki, and Syoji Okada, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 166,855, Jul. 8, 1980, abandoned. This application Nov. 23, 1982, Ser. No. 443,911

Claims priority, application Japan, Nov. 21, 1979, 54-149997

Int. Cl.³ F01F *1/18*

U.S. Cl. 123—193 C **1 Claim**

1. A free standing cylinder liner for use in an internal combustion engine comprising:

a sintered homogeneous ceramic mass of molded material having a density higher than 95% of theoretical density value of the material, a flexural strength greater than 50 kg/cm² at 800° C. and a randomly directed, homogeneous structure, wherein said material comprises a powdered raw material selected from the group consisting of silicon nitride, aluminum nitride, silicon oxynitride and silicon aluminum oxynitride which has been sintered in a furnace free from application of pressure thereon, wherein said sintered ceramic mass at least comprises silicon nitride.

4,419,972

AIR-FUEL INTAKE SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

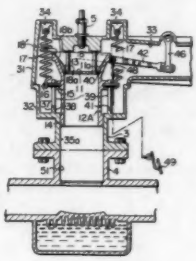
Tadashi Hattori; Hitoshi Yoshida, both of Okazaki; Keichi Akutagawa, Nagoya; Akira Takata, and Tamotsu Fukuda, both of Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 13, 1979, Ser. No. 75,683

Claims priority, application Japan, Sep. 19, 1978, 53-115527; Dec. 14, 1978, 53-155474; Dec. 14, 1978, 53-155475; Dec. 14, 1978, 53-155476; Dec. 14, 1978, 53-155477; Dec. 14, 1978, 53-155478; Dec. 14, 1978, 53-155480

Int. Cl.³ F02D *9/12*

U.S. Cl. 123—337 **11 Claims**



1. In an intake system for an internal combustion engine of the type comprising an intake pipe, fuel supply means for charging a fuel into said intake pipe so as to form an air-fuel mixture, an intake manifold for distributing the air-fuel mixture into cylinders of said engine, and a throttling system incorporated in said intake pipe between said fuel supply means and said intake manifold for controlling the flow rate of the air-fuel mixture to be delivered to said intake manifold, the improvement wherein said throttling system comprises:

a stationary valve body having a surface spaced downstream from said fuel supply means by a predetermined constant distance in opposed relationship therewith and on which the charged fuel impinges, said stationary body being substantially in the form of a disc,

a plurality of rods suspensing said stationary valve body from said intake pipe, and

a movable tubular valve body having an outer wall surface, a part of whic is slidably closely engaged with an inner wall surface of said intake pipe downstream of said stationary valve body, and an inner wall surface which cooperates with at least a portion of the peripheral edge of said stationary valve body to define a valve opening in said intake pipe between said inner wall surface of said movable valve body and said portion of said peripheral edge, said inner wall surface of said movable tubular valve body being formed with recess means which cooperates with only a portion of the peripheral edge of said stationary valve body to define said valve opening until the opening area of said valve opening reaches a predetermined value, the valve opening being defined between the entire peripheral edge of said stationary valve body and the entire periphery of said inner wall surface of said movable tubular valve body when the opening area of said valve opening exceeds said predetermined value,

said movable tubular valve body being movable relative to said stationary valve body in an axial direction of the former to vary the opening area of said valve opening, thereby controlling the air-fuel mixture charged into the cylinders of said engine.

4,419,973

DEVICE FOR THE CONTROL OF THE TRAVELING SPEED OF A MOTOR VEHICLE

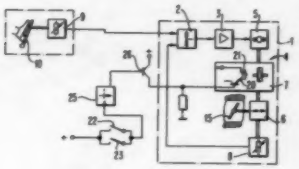
Harald Collonia, Königstein, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 86,828, Oct. 22, 1979, Pat. No. 4,313,408, which is a division of Ser. No. 894,371, Apr. 7, 1978, abandoned. This application Aug. 4, 1981, Ser. No. 289,850

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2754826; Mar. 30, 1977, 2714113; Dec. 2, 1977, 2753702; Dec. 2, 1977, 2753703

Int. Cl.³ F02D 11/10; F02B 17/00

U.S. Cl. 123—396 10 Claims



1. A device for the control of the traveling speed of a motor vehicle with a regulating unit actuatable by the vehicle driver, and means for transmission of the movement of the same to an element, which influences the air-fuel mixture, comprising

a regulating unit,

a first electrical position encoder being coupled with said regulating unit, said first position encoder having an output with an output signal,

means for influencing the air-fuel mixture of the vehicle,

an electrical adjusting device including a positioning actuator, the latter being operatively connected with said influencing means,

a second electrical position encoder being coupled with said positioning actuator, said second electrical position encoder having an output with an output signal,

means comprising an electrical controller including and for controlling said electrical adjusting device and having a desired value input connected with the output of said first electrical position encoder and applied with the output signal of said first electrical position encoder and having an actual value input connected with the output of said second electrical position encoder and applied with the output signal of said second electrical position encoder,

means for generating a resetting signal, there being a vehicle element which is coupled to said generating means for producing said resetting signal, said generating means including a first switch coupled to said vehicle element for closing an electrical circuit upon actuation of said vehicle element, the closing of said electrical circuit producing said resetting signal and,

said adjusting device including a coupling means operatively connected to said positioning actuator for operatively connecting and disconnecting said positioning actuator, respectively, in dependency on corresponding respective switching conditions of said coupling means,

means for inoperatively switching said coupling means only for a short time upon actuation of said vehicle element of the motor vehicle via said resetting signal, said switching means including a multivibrator means activated by initiation of said resetting signal via said switch said switching means further including a first transistor having a base thereof coupled to an output terminal of said multivibrator means for inoperatively switching said coupling means upon activation of said multivibrator means by said switch via said resetting signal, resulting in the only said short time inoperative switching of said coupling means whenever said vehicle element is initially actuated with a reactivation of said coupling means automatically after said short time expires after activation of said multivibrator means.

4,419,974

METHOD OF AND APPARATUS FOR CONTROLLING THE IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

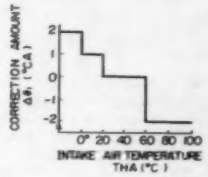
Masaomi Nagase; Hironobu Ono, both of Toyota; Jiro Nakano, and Hideo Miyagi, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

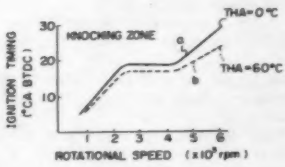
Filed Sep. 22, 1981, Ser. No. 304,558

Claims priority, application Japan, Sep. 27, 1980, 55-133680

Int. Cl.³ F02P 5/04

U.S. Cl. 123—418 16 Claims





1. A method of controlling the ignition timing of an internal combustion engine having an intake manifold, said method comprising the steps of:

detecting one of the flow rate of air sucked into the engine and the pneumatic pressure in the intake manifold, and producing a first electrical signal related thereto;

detecting the rotational speed of the engine and producing a second electrical signal related thereto;

calculating, in response to said first and second electrical signals, a spark advance angle which represents an optimum ignition timing at the operating condition corresponding to the detected flow rate of air or the detected pneumatic pressure and to the detected rotational speed;

detecting the temperature of air sucked into the engine to produce a third electrical signal which indicates the detected intake air temperature;

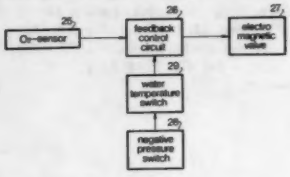
correcting, in response to said second and third electrical signals, said calculated spark advance angle, said correcting step including the steps of increasing said calculated spark advance angle by a variable value when the detected intake air temperature is lower than a predetermined temperature, and decreasing said calculated spark advance angle by a variable value when the detected intake air temperature is higher than the predetermined temperature, said variable value changing depending upon the difference between the detected intake air temperature and the predetermined temperature and upon the detected rotational speed indicated by the second electrical signal; and

controlling the timing of the sparks applied to the engine depending upon said spark advance angle.

4,419,975
AIR-FUEL RATIO CONTROL SYSTEM

Masaharu Kubota, Musashino; Ichiro Kudo, Tokyo, and Masaaki Ohgami, Musashino, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan

Filed Oct. 5, 1981, Ser. No. 308,864
Claims priority, application Japan, Oct. 11, 1980, 55-142194
Int. Cl.³ F02B *33/00*
U.S. Cl. 123—440 **8 Claims**



1. In an air-fuel ratio control system for an internal combustion engine having an induction passage, a carburetor, an electromagnetic valve for correcting the air-fuel ratio of the air-fuel mixture supplied to said carburetor, an O_2-sensor for detecting oxygen concentration of exhaust gases and producing an O_2 output signal dependent thereon, and a feedback control circuit having an input receiving said output signal, said feedback control circuit being operative as a feedback controller responsive to the output signal of said O_2-sensor for producing a control output signal for driving said electromagnetic valve for correcting the air-fuel ratio; the improvement comprising

first means for detecting the temperature of said engine for producing an output signal which varies with the temperature;

second means for detecting the operation of said engine for producing an output signal only when the throttle valve of the engine is widely opened;

first switch means responsive to said output signal of said second means for connecting the output signal of said first means to the input of said feedback control circuit together with the output of said O_2-sensor; and

second switch means responsive to said output signal of said second means to render said feedback control circuit inoperative as the feedback controller and operative as a controller means for producing an output signal so as to provide a duty ratio for providing rich air-fuel mixture independent on the output signals of said O_2-sensor and said first means;

said controller means being such that said duty ratio varies so as to increase the air-fuel ratio of the mixture as the temperature of said engine increases.

4,419,976
FUEL INJECTION CONTROL SYSTEM

Akio Hosaka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 23, 1981, Ser. No. 246,894
Claims priority, application Japan, Mar. 24, 1980, 55-36260
Int. Cl.³ F02D *5/02*; F02M *51/00*
U.S. Cl. 123—458 **9 Claims**

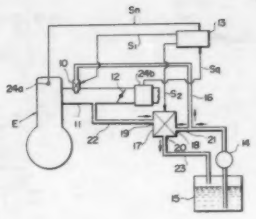
1. A fuel injection control system for an internal combustion engine, comprising:

(a) a sensor unit for detecting at least one engine operating condition and generating a signal indicative thereof;

(b) at least one intermittently opening fuel injection valve for supplying fuel to the engine;

(c) a regulator for maintaining the pressure across the fuel injection valve switchably at any one of a set of at least two different predetermined values; and

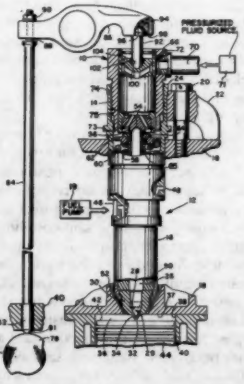
(d) a control unit for controlling the fuel injection valve and the regulator in response to the signal from the sensor unit to switch the pressure across the fuel injection valve from one to another of said predetermined values in accordance with the engine operating condition while maintaining the amount of fuel injected during each opening of the fuel injection valve independent of said switching of the regulated pressure.



4,419,977
FUEL INJECTION SYSTEM AND TIMING ADVANCE DEVICE THEREFOR

George A. Hillebrand, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 23,122, Mar. 23, 1979, abandoned. This application May 18, 1982, Ser. No. 379,401
Int. Cl.³ F02M *39/02, 47/02*
U.S. Cl. 123—502 **7 Claims**



1. A hydraulic device for selectively varying the force transmitting length of a member used in an internal combustion engine of the type having a train of members cyclically moved

in timed relationship to the engine power shaft for effecting combustion, said hydraulic device comprising:

(a) housing means adapted for adjustable mounting in an engine, and defining a hollow therethrough, said housing means including means defining a fluid port adapted for receiving pressurized fluid from a selectively activated source and operative to communicate the fluid to said hollow;

(b) unitary body means movably received in said hollow, said body means defining:

(i) first and second spaced cavities and a first fluid passage interconnecting said cavities said first cavity having the wall thereof extending a portion of the length of said body means,

(ii) a second fluid passage operative to communicate said first cavity with said fluid port;

(c) plunger means received in said first cavity and movable therein between a first and second position, said plunger means defining a third fluid passage operative to communicate with said second fluid passage, said plunger means cooperating with said first cavity wall to define a controlled leak-down clearance therebetween and an expansible fluid chamber, said leak-down clearance fluidically interconnecting said fluid chamber and said third fluid passage, said plunger means including one-way valve means operative upon introduction of said pressurized fluid into said third passage to communicate said pressurized fluid to said chamber for causing expansion of said chamber and movement of said plunger means relative to said body means;

(d) means biasing said plunger means in a direction for expanding said chamber;

(e) said body means further including means defining a reaction surface adapted for contacting an engine member in a train and operative, upon application of a force to said plunger means, to transmit said force to said engine member; and,

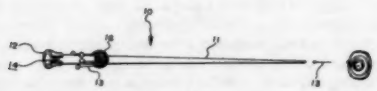
(f) pressure relief means operative to permit fluid above a predetermined pressure to flow from said chamber and exhaust to the atmosphere, wherein said plunger is operative in said first position to give said hydraulic device a first force transmitting length for effecting force transmission in a train of members and upon selective introduction of fluid at a predetermined pressure into said port means, said one-way valve permits fluid to flow to said chamber causing said plunger means to move to a position enlarging said chamber, whereupon said hydraulic device has a second force transmitting length for selectively effecting the motion of said train of members.

4,419,978

BREATH OPERATED DART APPARATUS INCLUDING PLASTIC FOAM QUIVER MEANS

Nolan M. Loftus, Ogden, Utah, assignor to Dynatec International, Inc., Salt Lake City, Utah

Filed May 5, 1982, Ser. No. 375,292
Int. Cl.³ F41B *1/02*
U.S. Cl. 124—62 **3 Claims**



1. A breath operated dart apparatus comprising:

an elongate, open ended tube adapted at one end thereof to receive air expelled from the lungs and mouth of the user;

elongate dart means adapted to be launched through and from the bore of the launching tube by the expelled air; and

dart quiver means adapted for securement to the launching tube, wherein the quiver means comprises plastic foam means having a bore therethrough for slideable frictional securement of the quiver means about the launching tube.

4,419,979

DRESSING AND FORMING OF GRINDING WHEELS

Robert B. Hughes, Isando, South Africa, assignor to Boart International, Ltd., Johannesburg, South Africa

Filed Mar. 16, 1981, Ser. No. 244,308
Claims priority, application South Africa, Mar. 19, 1980, 80/1581
Int. Cl.³ B24B *53/12*
U.S. Cl. 125—11 R **6 Claims**

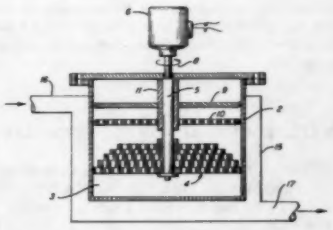
1. A dressing tool for dressing and forming of grinding wheels comprising a holder and a single triangular-prismatic hard material insert secured within and projecting forwardly from the holder to provide a cutting formation, said holder having a tapered end defining tapered surfaces aligned and coplanar with sides of said insert, said tapered end being further shaped to form shoulders on opposed sides of the insert, wherein a ratio of the length of a projecting exposed part of the insert to each shoulder length is at least 1:4, said material insert providing cutting action during wheel dressing and being a unitary body comprising a synthesized, intergrown mass of randomly oriented diamond particles sintered within a metal or ceramic matrix to provide first and second cutting edges being respectively engageable with a workpiece by indexing the tool approximately 180°.

4,419,980

FLAMELESS HEAT GENERATOR

Charles L. Leary, 623 Andover St., Lawrence, Mass. 01843, and Gerald C. Leary, 89 Page Rd., Bedford, Mass. 01730

Continuation-in-part of Ser. No. 327,811, Dec. 7, 1981. This application Mar. 25, 1983, Ser. No. 478,782
Int. Cl.³ F24C *9/00*
U.S. Cl. 126—247 **6 Claims**



1. A heating device comprising, in combination:

a. an enclosed container;

b. a drive shaft journalled into said container;

c. a set of at least four stacked perforate square flat plates centrally mounted onto said drive shaft near its lower end but offset one from another to expose the corners thereof, the flat surfaces of each being in face-to-face contact and rotating in a horizontal plane in a plane of rotation of said

drive shaft and having at least 50 perforations per square inch;

d. drive means for rapidly rotating said drive shaft;

e. a liquid within said container covering said plates and adapted to be heated by being worked by the rotation of said plates; and

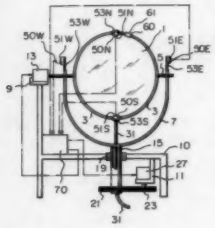
f. heat exchange means for passing a heat transfer medium in indirect heat exchange with said liquid and recovering thermal energy therefrom.

4,419,981

SUN TRACKING APPARATUS

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jun. 29, 1982, Ser. No. 393,386
Claims priority, application Japan, Jul. 1, 1981, 56-103600
Int. Cl.³ F24J 3/02
U.S. Cl. 126—425 **10 Claims**



1. A sun tracking apparatus comprising a rotatable vertical shaft, a horizontal shaft which is rotatably supported by the vertical shaft and whose axis is orthogonal to the axis of the vertical shaft, a first pair of optical detectors which are supported by the vertical shaft at symmetrically opposed positions substantially on the axis of the horizontal shaft, said optical detectors having substantially vertical outer sunlight receiving surfaces which face outside in opposite directions to one another, a second pair of optical detectors which are supported by the horizontal shaft, so as to rotate therewith, at symmetrically opposed positions substantially on an axis perpendicular to the horizontal axis, said second pair of optical detectors having substantially parallel inner sunlight receiving surfaces facing each other, a first driving means connected to the vertical shaft for rotating the same in a predetermined direction in accordance with outputs of the first pair of optical detectors, and a second driving means connected to the horizontal shaft for rotating the horizontal shaft in a predetermined direction in accordance with outputs of the second pair of optical detectors, said first and second driving means being driven only when there are differences in outputs between the first pair of optical detectors and between the second pair of optical detectors, respectively.

4,419,982

MAGNETIC EDGE SEAL FOR SOLAR COLLECTOR FILM

Robert E. Eckels, 2101 Youngfield, Golden, Colo. 80401

Filed May 10, 1982, Ser. No. 376,297
Int. Cl.³ F24J 3/02
U.S. Cl. 126—426 **1 Claim**

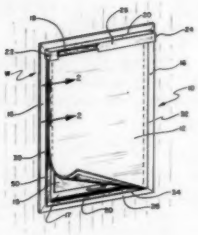
1. A magnetic edge seal for a flexible solar collector film material for forming a generally air-tight, heat insulating, reusable seal around the edges of a window opening in a surface of a building, the magnetic edge seal being provided to trap the air adjacent to said window opening to prevent it from entering the interior of said building while permitting solar energy to be converted to heat energy by said flexible film material so as to heat the air within said building, the magnetic edge seal comprising:

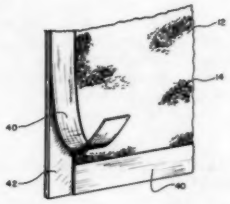
(a) a flexible film sheet material sized to overlap the edges of said window opening, said film material having a monolayer of transparent spheres adhered to the surface of said material facing said window opening;

(b) said flexible film material being arranged to be stored in the retracted position by being wrapped around a rotatably mounted roller positioned adjacent to the upper edge of said window opening;

(c) said rotatably mounted roller being positioned within an enclosed cover means positioned along the upper edge of said window opening whereby said edge is essentially sealed to prevent air flow;

(d) said film material being arranged to be extended downwardly across the said window opening by unrolling from said rotatably mounted roller whereby the sheet material completely covers said window opening and overlaps the edges of said opening;





(e) the edges of said sheet material having a continuous band of magnetically permeable particles adhered thereto; and

(f) a continuous magnetic strip means applied along the edges of said window opening corresponding to the overlapping edges of said sheet material containing said magnetically permeable particles, said magnetically permeable particles being attracted to said magnetic strip means whereby an effective air-tight seal is provided around the outer edges of said film material whereby the air adjacent to the window opening is essentially enclosed and trapped to prevent movement to the interior of said building while allowing the solar energy collected on the surface of said flexible material to be converted to heat energy and conducted to the interior of said building.

4,419,983

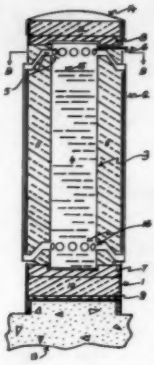
DEVICE FOR PASSIVE SOLAR HEATING AND STORAGE OF A LIQUID

Beecher J. Holland, 600 Morison Ave., Kingsport, Tenn. 37660

Continuation-in-part of Ser. No. 73,099, Sep. 6, 1979, abandoned, which is a continuation-in-part of Ser. No. 34,295, Apr. 30, 1979, abandoned, which is a continuation-in-part of Ser. No. 851,053, Nov. 14, 1977, abandoned. This application Sep. 28, 1981, Ser. No. 305,972

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—434 **1 Claim**



1. A passively operating solar collector comprising: an insulating support base, a vertically disposed reservoir tank mounted on said base, a plurality of essentially straight tubular conduits arranged longitudinally on the circumference of a cylinder surrounding said reservoir, the longitudinal axis of said cylinder laying essentially in a vertical north-south plane, a plurality of lower tubes, each tube being in fluid communication with the lower end of said reservoir tank and the lower end of one of said conduits wherein the point of communication of each of said lower tubes with said conduit is lower than the corresponding point of communication with said reservoir tank, a plurality of upper tubes, each tube being in fluid communication with the upper end of said reservoir tank and the upper end of one of said conduits, wherein the working fluid level in the reservoir in normal operation stands below the point of communication of each of said upper tubes with the upper end of said reservoir tank, and wherein the point of communication of each of said upper tubes with said conduit is lower than the corresponding point of communication with said reservoir tank.

4,419,984

RADIANT ENERGY COLLECTOR

William R. McIntire, Downers Grove, Ill., assignor to University Patents, Inc., Norwalk, Conn.

Filed Feb. 14, 1980, Ser. No. 121,541

Int. Cl.³ F24J *3/02*

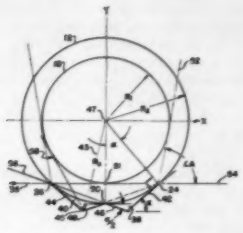
U.S. Cl. 126—439 **5 Claims**

1. A radiant energy concentration and collection device, comprising:

an energy absorber having a dimension R_1 from the center of said energy absorber to its lowermost extremity and a reflector spaced a distance R_2 from the center of said energy absorber,

said reflector adapted to redirect all radiant energy rays between first and second extremal rays onto said energy absorber, said first extremal ray being tangent to said energy absorber at a lower extremity, said second extremal ray being tangent to said energy absorber but oriented at an angle removed from said first extremal ray,

said reflector including at least first and second adjacent facets, each facet having opposed inner and outer arms joined at a nadir point and extending to an opening opposite said nadir point, said opening defined by the distance between the ends of said arms, each of said facet openings oriented towards said absorber, the ends of said inner arms of adjacent facets being joined at a distance R_2 from the center of said energy absorber, the outer ends of said outer arms of said facet lying on an imaginary circle of said energy absorber,



said outer arms of each facet sloped to reflect said second extremal rays onto said lower extremity of said energy absorber and any rays falling between said first and second extremal rays onto either the opposing inner arm of one facet or the opposing outer arm of said other facet and thence to the absorber, said inner arms of each facet being sloped to reflect all rays, either falling directly thereon or falling thereon as a result of a reflection from an outer arm, onto said absorber, the slope of said inner arms being defined by an angle $\alpha/2$ measured from said first extremal ray, where α substantially equals $\cos^{-1}R_1/R_2$.

4,419,985

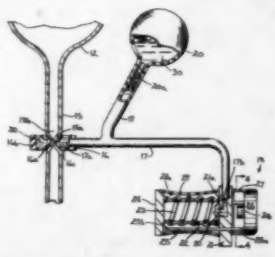
APPARATUS FOR REVERSIBLY CLOSING A BODY PASSAGE

Robert E. Trick, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.

Continuation of Ser. No. 182,468, Aug. 28, 1980, abandoned. This application Mar. 24, 1982, Ser. No. 361,466

Int. Cl.³ A61F *1/00*; A61B *17/00*

U.S. Cl. 128—1 R **2 Claims**



1. In an apparatus for implantation in a patient's body to control the flow of a body fluid through a body passage, wherein the apparatus has an inflatable means which can be inflated to close the body passage and deflated to open the body passage, and tubing connected at one end to the inflatable means to carry hydraulic fluid to and from the inflatable means, the improvement which comprises a push button actuated and expandable hydraulic fluid reservoir assembly also adapted to be implanted within the body which assembly includes:

(a) a support coupled to the other end of said tubing, said support having a passage therethrough for conveying hydraulic fluid;
(b) a rigid cap spaced from the support;
(c) an elongated pumping chamber extending from the support to the cap and attached to the cap, said chamber communicating with said passage in the support to receive and transmit hydraulic fluids and containing a substantial amount of hydraulic fluid even in its unexpanded state;
(d) a tension spring positioned within said pumping chamber and extending longitudinally between the support and the cap, said tension spring preventing the pumping chamber from being completely collapsed and emptied of hydraulic fluid in its unexpanded state;
(e) a push rod connected at one end to said cap and having the other end extending through and past the support, said push rod being located outside of the pumping chamber; and
(f) a push button mounted at the other end of the push rod; and

wherein said inflatable means, said tubing, said support passage and said pumping chamber form a closed system adapted to contain a pressurized fluid, so that when said push button is actuated said push rod will move said cap and thereby expand said pumping chamber from an initial volume containing a substantial amount of hydraulic fluid to a larger volume which will accommodate an added volume of hydraulic fluid from the inflatable means and cause said inflatable means to deflate due to the flow of hydraulic fluid through said tubing from said inflatable means to said pumping chamber.

4,419,986
EMBRYO TRANSFER APPARATUS

Stanley P. Leibo, San Antonio, Tex., assignor to Rio Vista International, Inc., San Antonio, Tex.

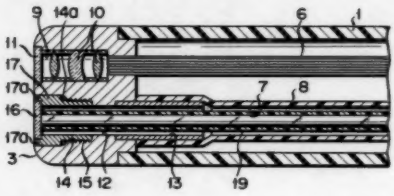
Division of Ser. No. 251,969, Apr. 7, 1981, Pat. No. 4,380,997.
This application Nov. 2, 1982, Ser. No. 438,596
Int. Cl.³ A61B *19/00*
U.S. Cl. 128—1 R **12 Claims**

12. An apparatus for storing, thawing and transferring a frozen embryo to a recipient animal comprising:
(a) a thin tubular plastic straw of the type typically used in artificial insemination procedures comprising a plug of porous material at the first end thereof and the heat seal closure at the second end thereof;
(b) a volume of a cryoprotective agent comprising a solution of glycerol in PBS in a concentration of from about 1.0 M to about 2.0 M said volume containing the embryo to be transferred;
(c) a volumetric amount of a diluent solution from about 6 to about 10 times as great as said volume of cryoprotective agent said diluent solution comprising sucrose in a PBS solution in concentrations of from about 0.5 M to about 1.0 M, the exact concentrations of said cryoprotective agent and diluent solution being adjusted so as to produce a substantially isosmolal condition upon mixture; and
(d) an air bubble separating said volume of cryoprotective agent from said diluent solution.

4,419,987
LASER ENDOSCOPE

Hisao Ogiu, Oume, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1980, Ser. No. 214,095
Claims priority, application Japan, Dec. 21, 1979, 54-166433
Int. Cl.³ A61B *1/00*
U.S. Cl. 128—4 **1 Claim**



1. A laser endoscope comprising:
an endoscope body having two ends;
a distal end portion fixed to one end of the endoscope body, the distal end portion having internal screw threads formed therein:
a control section fixed to the other end of the endoscope body;
a channel extending through the distal end portion, endoscope body and control section and having a distal end;
a holder which is detachably attached in the distal end portion, and, when attached in the distal end portion, covers the distal end of the channel in a liquid-tight state; and
a glass cover which is so disposed in the holder so as to face the distal end of the channel when said holder is put to use by being attached to the distal end portion;
said holder comprising a hollow cylindrical member having two ends, one end of which is fitted with the glass cover, and the other end of which is provided with external screw threads for engagement with the internal screw threads in the distal end portion; and
said holder further comprising notches formed at the end thereof which is fitted with the glass cover to provide means for gripping the holder so that it can be rotated to disengage from the internal screw threads in the distal end portion.

4,419,988
ELECTRONIC CIRCUIT FOR A DYNAMIC PRESSURE WAVE PNEUMATIC CONTROL SYSTEM

Thomas A. Mummert, Toledo, Ohio, assignor to Jobst Institute, Inc., Toledo, Ohio

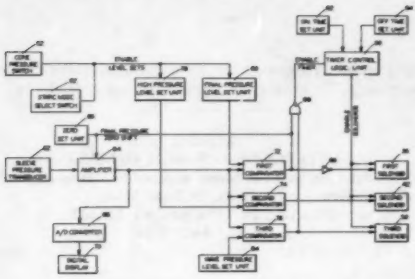
Filed Aug. 3, 1981, Ser. No. 289,267
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—24 R **29 Claims**

1. In an apparatus intended for use in applying compressive pressure to a mammal extremity including a first inflatable chamber, a second inflatable chamber, and pneumatic control means responsive to control signals and pneumatically connected to the first and second chambers for inflating and deflating the chambers from a source of pressurized gas such that the chambers apply compressive pressure to the extremity, an electronic circuit for regulating a pneumatic control means comprising:
means responsive to the pressure within a first chamber for

generating an enabling signal when a first predetermined pressure level has been reached;

means connected to said pressure responsive means and responsive to the absence of said enabling signal for generating a first control signal to the pneumatic control means to connect a source of pressurized gas to the first chamber, and responsive to the presence of said enabling signal for generating a second control signal to disconnect the first chamber from the source of pressurized gas and connect a second chamber to the source of pressurized gas;

means for generating a reference signal representing a second predetermined pressure level;



means responsive to the pressure within the second chamber for generating a signal representative thereof;

means responsive to said reference and second chamber pressure signals for generating a third control signal to vent the first chamber when the pressure in the second chamber equals or exceeds said second predetermined pressure level;

means for generating a reference signal representing a third predetermined pressure level; and

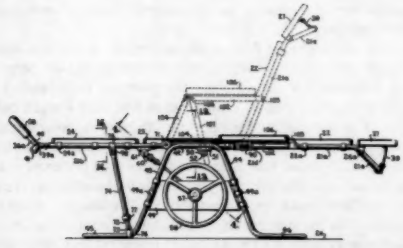
means responsive to said third pressure level reference signal and said second chamber pressure signal for generating a fourth control signal to disconnect the second chamber from the source of pressurized gas.

4,419,989

TILTABLE RECLINING AND SEATING DEVICE

Ted E. Herbold, 1909 E. 28th Ave., North Kansas City, Mo. 64116

Filed Apr. 6, 1981, Ser. No. 251,184
Int. Cl.³ A61F 5/00
U.S. Cl. 128—74 **13 Claims**



1. A therapy device comprising, in combination:

a pair of parallel oriented A-frame base members adapted to rest on a ground or floor surface with the lower end of the legs of the A,

a pair of first bearing collars, one fixed to each underside of the tops of the A-frames,

a first transverse cylindrical shaft received in and carried by said first bearing collars,

an elongate, rectangular, body-receiving frame having elongate side members and shorter transverse head and foot end beam members,

the said body-receiving frame configured at the ends thereof so as to provide a downwardly angled head end and an upwardly angled foot end,

a pair of second bearing collars, one fixed to each underside of the elongate side members of the body-receiving frame intermediate the length thereof, said second collars engaging and carried by the first cylindrical shaft inboard of the first bearing collars whereby said frame is positioned inboard of the A-frame members,

the frame pivotable with respect to the base members on its first shaft mounting,

two opposed, substantially parallel plate members, one carried between each pair of A-frame legs and fixed thereto,

a second transverse shaft rotatably received between said two plate members below said first shaft and extending through said plate members at the ends thereof,

a turning wheel removably fixed to at least one end of the second shaft outside of the said plate members,

a third transverse shaft mounted on said extending between the elongate frame side members and located between the first shaft and the foot end of the frame,

the second shaft having opposed, reversed screw threads thereon intermediate the outboard ends thereof and inboard of the plate members, the said reversed threads spaced centrally apart from one another on the second shaft,

an X frame made up of two centrally pivoted elongate arm members communicating between and connected at the ends of the members thereof to the said second and third shafts,

the lower connection being by nuts pivotably mounted on the lower ends of the X frame members which are threadably engaging the said second shaft screw threads and the upper connection being by bushings pivotably mounted on the upper ends of the X frame members which are slidably engaging the third shaft,

whereby rotation of the second shaft in one direction moves the nuts engaging the second shaft screw threads toward one another, thus lengthening the X frame along the longitudinal axis of the frame and elevating the foot end of the frame from normal horizontal upwardly, and rotation of the second shaft in the other direction moves the nuts engaging the threads away from one another, shortens said X frame along said axis, thus lowering the foot end of the frame toward normal horizontal,

the upwardly angled foot end of the body receiving frame having a transverse beam member extending between and connecting the said elongate side members adjacent the ends of the straight portions thereof and the upwardly angled foot end, and

a plurality of body carrying, transverse support members provided communicating between and carried by the elongate side members along the length thereof between the downwardly angled frame head end and upwardly angled foot end.

4,419,990

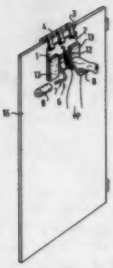
APPARATUS FOR RELIEVING THE SPINAL COLUMN

Helmut Forster, Greppenstrasse 77, 8031 Alling, Fed. Rep. of Germany

Filed Feb. 19, 1981, Ser. No. 236,109
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007835
Int. Cl.³ A61H 1/02
U.S. Cl. 128—75 **23 Claims**

1. A portable apparatus for relieving the spinal column, comprising a support element, a counter-support sized to bear against at least the top of a typical closed door or its door frame without passing through the slot therebetween, flexible means connecting the support element to the counter-support and sized to pass through said slot, and suspension means in the

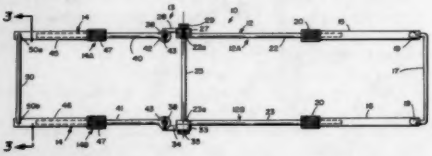
form of a bracket of generally T-shaped configuration having a cross-piece extending generally parallel to the support element in a manner to engage and fully suspend a patient by his feet or by a head sling and having a foot portion solely pivotally attached to said support element so as to afford a range of rotation of said bracket between a position substantially perpendicular to said support element and a downward position substantially parallel to said support element when in use mounted on said door through said slot.



4,419,991
SPLINT

Roger Lee, 9533 Sunnyside Ave., Ben Lomond, Calif. 95005

Filed Apr. 29, 1982, Ser. No. 372,918
Int. Cl.[3] A61F 5/04
U.S. Cl. 128—88 7 Claims



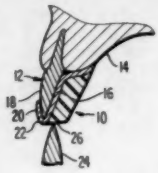
1. A splint comprising first and second limb-support sections, and a plurality of transversely spaced articulated joints connecting said sections for pivotal adjustment in directions to move one section from a position of general longitudinal and planar alignment with the other section to a position wherein the plane of one section is inclined relative to the plane of the other section and said one section is slanted away from longitudinal alignment with said other section, said articulated joints comprising a plurality of transversely spaced arms connected for pivotal adjustment at one end to said one section and connected for pivotal movement at the other end to said other section, a pivot axis between each arm and said one section being at right angles to and spaced from a pivot axis between the same arm and said other section.

4,419,992
OCCLUSAL SPLINTS AND THE METHOD OF MANUFACTURING THE SAME

Peter M. Chorbajian, 10004 Carter Rd., Bethesda, Md. 20034

Filed Feb. 12, 1981, Ser. No. 233,725
Int. Cl.[3] A61F 5/56
U.S. Cl. 128—136 5 Claims

1. An occlusal splint sized and shaped to be worn on the upper arch of the mouth over the teeth, said occlusal splint being formed of two layers of resin, the upper layer molded to conform to the shape of the upper teeth and to be resiliently retained thereon, and a lower layer formed of a cold-cure resin built up on the upper layer, the lower surface of said lower layer shaped so that when the lower jaw is moved toward the upper arch with the condyls of the wearer in their retruded rest position the upper surfaces of the lower teeth will engage said lower surface of the splint at the same time and said areas of

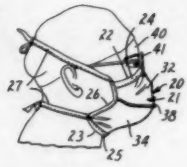


engagement of those teeth that are in engagement are all below the plane of the lowermost edges of said upper teeth.

4,419,993
ANTI-FOGGING SURGICAL MASK

Neil E. Petersen, St. Paul, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Dec. 10, 1981, Ser. No. 329,603
Int. Cl.[3] A62B 7/00
U.S. Cl. 128—201.15 14 Claims



1. An anti-fog surgical mask for covering at least the nose, mouth and a portion of the chin of the wearer, comprising:

(a) a main body portion having an upper edge and a lower edge and comprising a filter portion between said upper edge and said lower edge, said filter portion comprising a filter means extending from about said upper edge to a location at about the chin of the wearer, said filter means divided into an upper region and a lower region, said upper region of said filter means being located at about said upper edge and providing between about 25 and 70 percent of the total area of said filter means, and said lower region of said filter means being adjacent to said upper region of said filter means and providing substantially the remainder of the total area of said filter means;

said filter means being further characterized in that said upper region and said lower region of said filter means are permeable substantially throughout, the average permeability of said upper region of said filter means is at least about 6 cubic feet of air per square foot per minute, and the average permeability of said lower region of said filter means is at least about 22.25 cubic feet of air per square foot per minute and is greater than the average permeability of said upper region of said filter means by at least about 2.25 cubic feet of air per square foot per minute, the permeabilities being measured in accordance with ASTM D 737-75 (Reapproved 1980) using a pressure differential of 0.5 inch of water across said filter means;

(b) means at said upper edge for providing an effective seal between said upper edge of said main body portion and the nose of the wearer; and

(c) means attached to said main body portion for securing said mask over the mouth and the nose of the wearer; said mask being substantially flexible and said upper region being oriented with respect to said lower region such that exhaled air

is directed away from the eyes of the wearer of said mask in order to reduce the possibility of fogging eyeglasses.

4,419,994
RESPIRATORS

Joseph R. Hilton, Guildford, England, assignor to Racal Safety Limited, Middlesex, England

Continuation-in-part of Ser. No. 134,661, Mar. 27, 1980, abandoned. This application Jun. 22, 1981, Ser. No. 276,163
Claims priority, application United Kingdom, Jul. 3, 1980, 8021880
Int. Cl.³ A62B 7/00
U.S. Cl. 128—206.19 **13 Claims**

1. A generally cup-shaped filtering facepiece formed of flexible filtering material adapted to cover the nose and mouth of a user, said facepiece comprising

(a) convergent generally frusto-conical side wall means having at its larger end a peripheral free edge (4); and

(b) end wall means (2) closing the smaller end of said side wall portion, thereby to define a pocket (1) for receiving the nose and mouth of the user with said peripheral edge extending over the nose and under the chin of the user, said end wall means including

(1) a plurality of end wall panels (7) foldably connected with said side wall means by four first fold lines (11, 12) that are interconnected by four apices (e, f, g, h), respectively, said end wall panels being connected with each other by central fold line means (8) that extend between a pair of opposite apices (g, h), thereby to define between said four interconnected fold lines a quadrilateral region having two triangular panels

(2) said end wall panels being folded inwardly about said four interconnected fold lines to cause said quadrilateral region to extend reversely within said pocket at the closed end of the facepiece; and

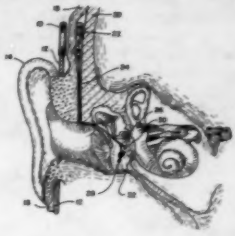
(c) means (13,14) for attaching said facepiece to the wearer's head.

4,419,995
SINGLE CHANNEL AUDITORY STIMULATION SYSTEM

Ingeborg J. Hochmair, and Erwin S. Hochmair, both of A-1130 Wien Jaunerstrafse 27, Vienna, Austria

Filed Sep. 18, 1981, Ser. No. 303,547
Int. Cl.³ A61N 1/18
U.S. Cl. 128—419 R **19 Claims**

1. A method of chronic auditory stimulation of the cochlea for imparting speech patterns comprising the steps of placing an active electrode and a ground electrode outside of and near the base of a cochlea of a patient, and energizing said electrodes with an electrical signal having a frequency band which is sufficient to define a speech pattern thereby establishing an

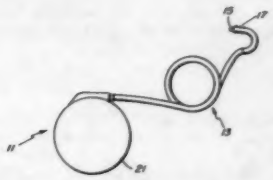


electric field between said active electrode and said ground electrode.

4,419,996
CARDIAC PACER APPARATUS

Peter P. Tarjan, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Mar. 12, 1981, Ser. No. 243,135
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG **12 Claims**



1. A system for cardiac treatment comprising:

an implantable pacer including circuit means having alternately a normal standby nontriggered demand pacing mode and a temporary triggered stimulation mode, said pacer being provided with a lead for electrically coupling said circuit means to the heart of a patient within whom the pacer is implanted, said circuit means including means for sensing electrical signals around the heart and means for providing electrical pulses suitable for stimulating the heart, said circuit means being operative in said standby mode to selectively provide inhibited stimulation of a patient's heart and operative in said triggered mode to provide nondelayed stimulation in substantial synchronism with sensed electrical trigger signals, said pacer including magnetically operable switch means for transferring said circuitry between said standby mode and said triggered mode; and

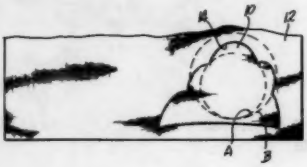
an external controller for selective temporary use in conjunction with said implantable pacer, said controller including means for generating a magnetic field suitable for operating said switch means and including also signal generating circuit means for applying, to a patient, pulsating electrical trigger signals which can be sensed by the implantable pacer circuitry when operating in said triggered mode,

whereby said implantable pacer will normally operate independently in a standby mode but, upon application of said controller, will operate in a triggered mode which can be manipulated externally to treat arrhythmias.

4,419,997
METHOD OF FABRICATING TWO LAYER CUPS AND BRASSIERE

Raymond Cole, Hillsdale; Raymond Kennedy, Montvale, and Lincoln McCluskey, Montville, all of N.J., assignors to International Playtex, Inc., Stamford, Conn.

Division of Ser. No. 280,402, Jul. 6, 1981, Pat. No. 4,375,445. This application Feb. 17, 1983, Ser. No. 467,614
Int. Cl.³ A41C 3/00
U.S. Cl. 128—489 4 Claims

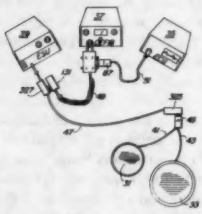


1. In a brassiere having a pair of breast cups, a support frame for each cup, and torso-encompassing portions for each support frame and shoulder straps, the improvement comprising:
- a first layer of material forming a substantial portion of each of said breast cups, and a portion of said support frame;
- a second layer of material forming said breast cups, said support frame and said torso-encompassing portion;
- said first layer being attached to said second layer at the periphery of the first layer;
- said first and second layers being non-stretchable at the crown of the cups, substantially non-stretchable longitudinally at the remainder of the cup and stretchable multidirectionally at the support frame.

4,419,998
PHYSIOLOGICAL ELECTRODE SYSTEMS

Roger L. Heath, Evanston, Ill., assignor to R2 Corporation, Skokie, Ill.

Filed Aug. 8, 1980, Ser. No. 176,270
Int. Cl.³ A61B 5/04
U.S. Cl. 128—639 45 Claims

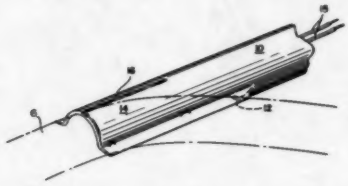


1. A physiological electrode system for use in conveying electrical signals to and from between the human body and certain electrical devices comprising:
- a first non-invasive electrode element to be attached to the skin of a patient;
- a second non-invasive electrode element to be attached to the skin of the patient, said first and second electrode elements capable of producing desired operation of each of a monitoring device, a stimulating device and a therapeutic device;
- interrelating means for selectively separately connecting said electrode elements to a monitoring device, a stimulating device or a therapeutic device to produce desired operation of each such device through said electrode elements, the monitoring device, the stimulating device and the therapeutic device being otherwise separate and unrelated, said interrelating means providing for the simultaneous connection of said electrode elements to at least two of said devices; and
- protective means associated with said interrelating means for selectively permitting desired combinations of the monitoring device, the stimulating device and the therapeutic device to be simultaneously connected to the patient solely through said first and second electrode elements.

4,419,999
METHOD AND APPARATUS FOR MONITORING VASCULAR FLOW

James W. May, Jr., Sandy Pond Rd., Lincoln, Mass. 01773; Frederick N. Lukash, 444 Lakeville Rd., Lake Success, N.Y. 11042, and Kenneth H. Cohn, 94 Francis St., Brookline, Mass. 02146

Continuation-in-part of Ser. No. 255,247, Apr. 17, 1981, abandoned. This application Dec. 7, 1981, Ser. No. 327,785
Int. Cl.³ A61B 5/02
U.S. Cl. 128—691 5 Claims



1. In the measurement of blood flow at a selected site in tissue of an animal body by monitoring temperature with sensor means, the improvement comprising the steps of
- A. providing electrical thermal sensor means having electrical leads extending therefrom,
- B. providing an implantable housing element configured to conform with a portion of a blood vessel and carrying said sensor means on a surface thereof for disposition contiguous with a vessel adjacent to which said element is implanted,
- C. surgically implanting said housing element within the animal body next to the wall of a vessel in which said blood flow is to be measured, for implanting said sensor means contiguous with tissue of the body and with said electrical leads extending transcutaneously therefrom,
- D. monitoring temperature sensed by said implanted housing-carried sensor means by monitoring the electrical signal on said leads, for providing an indication of relative blood flow in said vessel, and
- E. adapting said housing element with said sensor means for atraumatic removal from said body by transcutaneous withdrawal from said surgically-implanted location by pulling on said electrical leads.

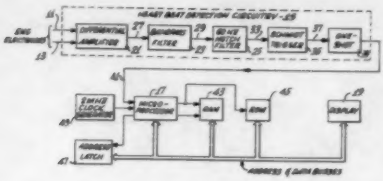
4,420,000
METHOD AND APPARATUS FOR MEASURING HEARTBEAT RATE

Wilber H. Bailey, Leucadia, Calif., assignor to Camino Laboratories, Inc., San Diego, Calif.

Filed Sep. 28, 1981, Ser. No. 306,329
Int. Cl.³ A61B 5/04
U.S. Cl. 128—706 24 Claims

1. A heart rate monitor comprising:
- detection means for measuring the time intervals between the successive beats of a heart and for producing a corresponding sequence of timing measurements;
- averaging means for averaging a prescribed set of the successive timing measurements, to produce a measurement average; and
- adjusting means for comparing each timing measurement in

the set with the measurement average and adjusting a particular measurement in the set in accordance with the comparisons, thereby producing an adjusted set of timing measurements;



wherein the means for averaging further operates to average the adjusted set of timing measurements, to produce an estimate of heartbeat rate.

4,420,001

RESPIRATORY MEASURING DEVICES

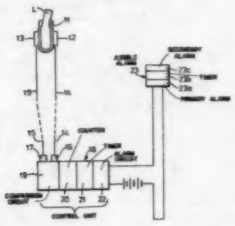
Keith M. T. Hearne, Flat C, 17, Pearson Ave., Hull. North Humberside, England (HU5 2SX)

Filed Jan. 17, 1980, Ser. No. 112,983

Claims priority, application United Kingdom, Jan. 19, 1979, 7902117

Int. Cl.³ A61B 5/08

U.S. Cl. 128—724 7 Claims



1. A respiration rate measuring device for measuring the respiration rate of a person comprising, in combination,

(a) a temperature sensitive element intended to locate in a breathing duct or the air flow to and from a breathing duct of the person,

(b) means for locating said element in said breathing duct or in said air flow,

(c) control means for counting temperature changes sensed by said temperature sensitive element, and

(d) alarm means actuated by said control means when the rate of temperature change sensed by said temperature sensitive element rises above a predetermined value characterized in that

(e) said alarm means includes means effective on the person to whom the device is fitted, to make the person, when asleep, aware that the alarm means has actuated without being shocked from sleep.

4,420,002

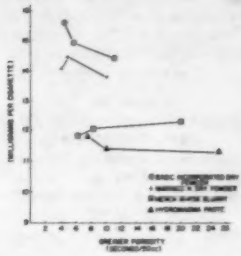
WRAPPER FOR SMOKING ARTICLES AND METHOD

Warren K. Cline, Brevard, N.C., assignor to Olin Corp., Pisgah Forest, N.C.

Filed Apr. 7, 1982, Ser. No. 366,313

Int. Cl.³ A24D 1/02, 3/16

U.S. Cl. 131—334 20 Claims



1. A wrapper for smoking articles such as cigarettes, cigars and the like comprising a cellulosic sheet containing a filler of fine grain magnesium hydroxide having an average particle size less than 10 micrometers and unreactive magnesium oxide.

4,420,003

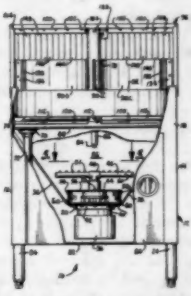
GLASS WASHING MACHINE

Quarterman Lee, Kansas City; Larry E. Watson, Parkville, and Glenn E. Montgomery, Lee's Summit, all of Mo., assignors to T.C.A., Inc., Richmond, Va.

Continuation-in-part of Ser. No. 148,739, May 12, 1980, abandoned. This application May 4, 1981, Ser. No. 259,970

Int. Cl.³ B08B 3/02, 9/08

U.S. Cl. 134—80 23 Claims



1. Glassware washing apparatus comprising:

a housing presenting a loading zone for receiving dirty glassware, a washing zone for washing and rinsing the glassware, and an unloading zone for removal of clean glassware;

a rack mounted in said housing for rotation about a generally vertical axis, said rack being adapted to receive and support glassware thereon;

three partitions carried on said rack for rotation therewith and dividing said rack into three separate adjacent compartments, each of said compartments being successively positioned in the loading zone, the washing zone and the unloading zone upon rotational indexing of said rack;

means for washing the glassware disposed on said rack in the compartment positioned in said washing zone while said rack is stationary;

means operable subsequent to said washing means for rinsing

the glassware disposed on said rack in the compartment positioned in said washing zone while said rack is stationary; and

an opening in said housing providing simultaneous access to both said loading and unloading zones for loading of dirty glassware into the loading zone and unloading of clean glassware from the unloading zone, thereby permitting each batch of dirty glassware to be loaded onto said rack in the loading zone, washed and rinsed in said washing zone following one rotational indexing of the rack, and unloaded from the rack in the unloading zone following another rotational indexing of the rack.

4,420,004

APPARATUS FOR USE IN CLEANING OF SILK SCREEN PRINTING FRAMES

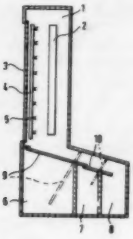
Sverre Jensen, Bruveien 9, Stavanger, Norway (N-4000)

Filed Nov. 19, 1981, Ser. No. 322,976

Claims priority, application Norway, Nov. 27, 1980, 803583

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—96 **3 Claims**



1. A silk screen printing frame cleaning apparatus comprising:

a closeable chamber in which a silk screen printing frame is adapted to be held;

a plurality of liquid applying means mounted in said chamber and movable with respect to said frame;

a plurality of means for containing liquids to be applied by said liquid applying means to the frame;

means for conveying the liquids from one of said containing means to an associated one of said plurality of applying means;

means for returning applied liquid to the containing means from which said applied liquid was conveyed;

said plurality of liquid containing means being disposed below said chamber and formed by walls of said apparatus in cooperation with a series of partitions of decreasing height, each of said liquid containing means having a substantially planar lid having an upper and lower end, each of said lids being pivotally attached intermediate said upper and lower ends and adjacent to an upper edge of one of said partitions, the lower end of each of said lids overlapping an adjacent lid, said closed lids forming a downwardly sloping surface whereby the liquids flow down said sloping surface and into a containing means whose associated lid is open.

4,420,005

WATER POWERED DISHWASHER

Daniel Armstrong, 1842 Harbor Pl., Naples, Fla. 33942

Filed Nov. 1, 1982, Ser. No. 438,011

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—100 **6 Claims**

1. A water powered dishwasher comprising

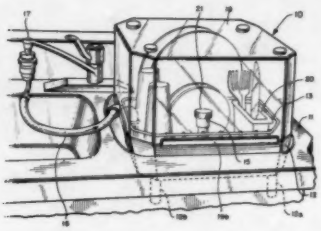
a four-sided base;

a four-sided dishrack lying within said base and removably supported by the upper rim of said base;

a water and liquid detergent mixing chamber located at the center of said dishwasher and mounted on said dishrack;

a rigid pipe mounted on said dishrack, one end of said pipe being connected to a flexible hose leading to a water faucet and the other end of said pipe being connected to said mixing chamber;

a dispenser for storing and dispensing a quantity of liquid



detergent lying axially above and communicating with said mixing chamber;

a rotatable spray arm mounted beneath said dishrack, said arm including a T-shaped central hub connected to and lying axially beneath said mixing chamber and a plurality of tubular arm segments extending from said hub; and

a clear plastic dome-shaped cover whose lower edge rests upon flanges extending from the upper rim of said base.

4,420,006

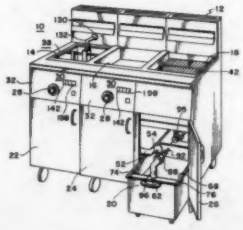
SPRAY CLEANING SYSTEM FOR FRYING APPARATUS

L. Frank Moore, and George M. Price, both of Shreveport, La., assignors to The Frymaster Corporation, Shreveport, La.

Division of Ser. No. 753,936, Dec. 23, 1976. This application Oct. 20, 1978, Ser. No. 953,079

Int. Cl.³ B08B *3/02, 9/08*

U.S. Cl. 134—167 R **3 Claims**



1. In a fry pot of the type having an interior side surface formed by the union of first, second, and third planar surfaces, the first planar surface having an edge which cooperates with the remaining interior side surfaces to define the mouth of the fry pot, the second planar surface projecting laterally from the first planar surface into the fry pot thereby defining a ledge, and the third planar surface being disposed intermediate the ledge and the floor of the fry pot, and wherein a fluid coupling member having a discharge port is mounted through the third planar surface beneath the ledge, the combination with the fry pot of a removable shower apparatus for insertion into the fry pot to discharge jets of cooking oil along the interior side surfaces, the shower apparatus comprising:

a continuous tubular member having an inlet port for receiving a flow of cooking oil and having tubular side sections which are laterally displaced with respect to each other in conformance with the lateral displacement of the interior side surfaces of the fry pot, the tubular side sections being

substantially coextensive with the lateral peripheral dimensions of the corresponding fry pot interior side surfaces for permitting nesting engagement of the shower apparatus with the fry pot, each tubular side section having at least one outlet port for discharging a jet of cooking oil into the adjacent interior side surface of the fry pot;

a transverse tubular section interconnecting a pair of the tubular side sections in fluid communication; and,

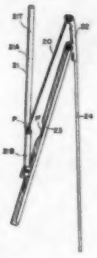
a coupling member connected in fluid communication with the transverse tubular section, the coupling member including a rigid body portion and a conduit formed therein, the conduit including an inlet port formed at one end of the coupling member and a laterally projecting flange portion disposed intermediate the inlet port and the transverse tubular member, the inlet port and flange portion being arranged to permit registration of the fluid coupling member with the inlet port concurrently with engagement of the flange portion with the ledge as the shower apparatus inserted into the frypot.

4,420,007

COMPONENT FRAMEWORK STRUCTURE FOR THE FRAME OF A FOLDABLE UMBRELLA

Tsun Z. Wu, No. 15, Lan 52, Ho-Ping West Rd., Section 3, Taipei, Taiwan

Filed Jan. 11, 1982, Ser. No. 338,267
Int. Cl.³ A45B *19/00*
U.S. Cl. 135—25 R **8 Claims**



1. A component framework structure for the frame of a foldable umbrella comprising:

an upper notch member;

an auxiliary stretcher made of at least one piece of flat plate material having a bend therein so that an upper portion of said auxiliary stretcher extends in a different plane from a lower portion thereof, said auxiliary stretcher being pivotally connected at a top end thereof to said notch member;

a tension rib pivotally connected at one end thereof to said auxiliary stretcher adjacent said bend;

a main rib pivotally connected at one end thereof to an opposite end of said tension rib; and

a main stretcher pivotally connected at a top end thereof to said main rib at a point on said main rib spaced from its ends, said main stretcher pivotally connected at an intermediate location thereon to a lower end of said auxiliary stretcher;

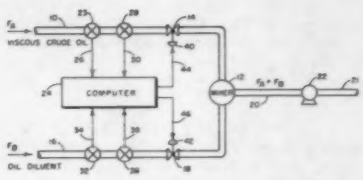
the pivotal connection between said main stretcher and main rib, and between said main rib and said tension rib forming a head joint which, with said umbrella folded, lies next to said auxiliary stretcher upper portion.

4,420,008

METHOD FOR TRANSPORTING VISCOUS CRUDE OILS

Winston R. Shu, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 29, 1982, Ser. No. 344,095
Int. Cl.³ F17D *1/16, 1/17*
U.S. Cl. 137—4 **6 Claims**



1. A method for transporting viscous crude oil in a pipeline, comprising:

(a) providing a stream of viscous crude oil in a first conduit;

(b) providing a stream of oil diluent having a relatively low viscosity in a second conduit;

(c) mixing the stream of viscous crude oil with the stream of oil diluent to form a mixture thereof;

(d) pumping said mixture through said pipeline at a desired viscosity and at a desired flow rate equal to the sum of the flow rate of the viscous crude oil and the oil diluent;

(e) constantly measuring the viscosity and specific gravity of said viscous crude oil in said first conduit and producing signals repesentative of the viscosity and specific gravity of the viscous crude oil in said first conduit;

(f) constantly measuring the viscosity and specific gravity of said oil diluent in said second conduit and producing signals representative of the viscosity and specific gravity of the oil diluent in said second conduit;

(g) constantly providing a digital computer with said signals including signals representative of the desired viscosity of the mixture in the pipeline and the desired flow rate of the mixture in the pipeline;

(h) constantly calculating in the computer, the flow rate of the viscous crude oil in said first conduit and the flow rate of the oil diluent in said second conduit in accordance with

$$\mu = \mu_A^{X_A} \mu_B^{X_B} \tag{1}$$

$$X_A = \frac{\alpha V_A}{\alpha V_A + V_B} \tag{2}$$

$$X_B = 1 - X_A \tag{3}$$

$$\alpha = \frac{17.04\Delta\rho^{0.5237}\rho_A^{3.2745}\rho_B^{1.6316}}{\ln\left(\frac{\mu_A}{\mu_B}\right)} \tag{4}$$

$$\Delta_\rho = \rho_A - \rho_B \tag{5}$$

$$\frac{F_A}{F_B} = \frac{V_A}{V_B} \tag{6}$$

$$F = F_A + F_B \tag{7}$$

where

μ is the viscosity of the mixture,

μ_A is the viscosity of the viscous crude oil,

μ_B is the viscosity of the oil diluent,

V_A is the volume fraction of viscous crude oil,

V_B is the volume fraction of oil diluent,

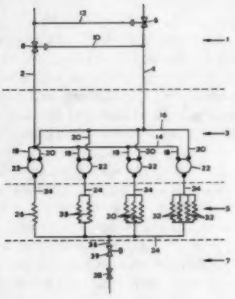
ρ_A is the specific gravity of the viscous crude oil,

ρ_B is the specific gravity of the oil diluent,
F_A is the flow rate of the viscous crude oil,
F_B is the flow rate of the oil diluent, and F is the flow rate of the mixture;
(i) constantly controlling the flow rate of the viscous crude oil in the first conduit to correspond to the resultant calculated flow rate determined by the computer during step (h); and
(j) constantly controlling the flow rate of the oil diluent in the second conduit to correspond to the resultant calculated flow rate determined by the computer during step (h).

4,420,009
APPARATUS FOR MIXING FLUIDS

Derek J. Sharp, and Robert C. Watts, both of Sutton, England, assignors to BOC Limited, London, England

Continuation of Ser. No. 137,099, Apr. 4, 1980, abandoned. This application Oct. 13, 1981, Ser. No. 310,934
Claims priority, application United Kingdom, Apr. 6, 1979, 7912269
Int. Cl.³ G05D *11/03*; F15D *1/00*
U.S. Cl. 137—98 **12 Claims**

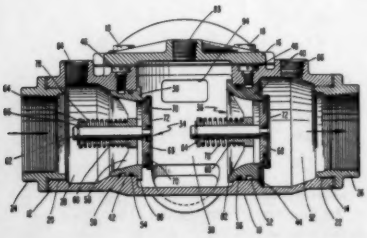


7. Fluid mixing apparatus according to claim 5, in which the elongate flow restrictors are capillary tubes.

4,420,010
IN-LINE BACK FLOW PREVENTER

Bernard B. Becker, Belmont; John K. Bowman, Brighton, and Cyril A. Randall, Belmont, all of Mass., assignors to Amtrol Inc., West Warwick, R.I.

Continuation of Ser. No. 890,964, Mar. 28, 1978, Pat. No. 4,232,704. This application Mar. 7, 1980, Ser. No. 128,240
The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.
Int. Cl.³ E03B *7/07*
U.S. Cl. 137—116 **2 Claims**

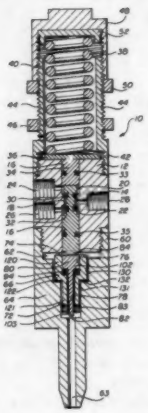


1. Device for preventing the back flow of water from a point of use into a water supply line comprising a unitary casing having an inlet, a central chamber, an outlet, a removal port and a drain vent opening, said inlet, said central chamber and said outlet being coaxially aligned, a relief valve in fluid communication with said central chamber and offset from said coaxial alignment of said inlet, said central chamber and said outlet, said removal port being located in the casing in direct communication with the central chamber, a cover for said removal port, a pair of check valves, one of said check valves being mounted between said inlet and said central chamber, the other of said check valves being mounted between said outlet and said central chamber, and said pair of check valves being coaxially aligned with said inlet, said central chamber and said outlet, whereby water passes essentially in a straight-through flow path through said device, and the back flow of water is prevented, means for removal of said pair of coaxially aligned check valves from said casing without removing said relief valve, and a flexible diaphragm formed integrally with a gasket located between said casing and said removable cover attached thereto, said gasket having an opening therethrough which allows removal of said check valves without disturbing said gasket or said flexible diaphragm, said relief valve being actuated by a pressure differential across said flexible diaphragm, one side of said diaphragm communicating with said central chamber and the drain vent opening and the other side of said diaphragm communicating with said inlet.

4,420,011
DUAL PISTON SENSING MECHANISM

Harry Roger, 124 Banks Ave., Lafayette, La. 70506

Filed Dec. 8, 1981, Ser. No. 328,606
Int. Cl.³ F16K *31/122*
U.S. Cl. 137—269 **2 Claims**



1. A pilot valve comprising:
(a) a valve body, having:
(1) an elongated bore therein,
(2) a first fluid inlet port communicating with said said bore,
(3) a second fluid inlet port communicating with said bore,
(4) an outlet port communicating with said bore, and
(5) a sensing port communicating with said bore;
(b) a valve element slidably engaged within said bore for regulating the flow of fluid through said pilot valve, said valve element being shiftable between
(1) a first position permitting communication between said first inlet port and said outlet port and precluding communication between said second inlet port and said outlet port; and
(2) a second position permitting communication between said second inlet port and said outlet port and precluding

communication between said first inlet port and said outlet port;

(c) means for urging said valve element into its first position, the improvement comprising:

a piston means slidable within a piston chamber for shifting said valve element from its first position to its second position, said piston means being exposed to said sensing port so that sufficient fluid pressure applied to said sensing port will cause said piston means to engage said valve element to shift said element from its first position to its second position, against the action of said urging means, said piston means comprising:

(a) a first piston slidable within said piston chamber, said first piston having a first and second sections, said first section being of larger diameter and concentrically aligned with said second section, and having a concentric bore therethrough, said concentric bore being of first and second sections, said sections being aligned with the first and second sections of said first piston, said first section of said concentric bore being of larger diameter than the second section of the concentric bore, and

(b) a second piston slidably mounted within said first piston, said second piston having first and second sections, said first section of said second piston being of larger diameter than said second section and slidably in contact with the first section of said concentric bore of said first piston, the length said first section of said second piston being less than that of said first section of said concentric bore, and said second section of said second piston being slidably in contact with the second section of said concentric bore;

(c) seal means annularly mounted around said second section of said second piston and having an outer diameter substantially the same as that of the second section of said first piston so as to hermetically seal said sensing port from the elongated bore, said seal means being capable of sliding movement within said piston chamber in response to the fluctuating fluid pressure within said sensing port and in response to movement by said first piston.

(d) spacer means for positioning said second piston within said first piston, said spacer means being placed at the juncture of the first and second sections of said second piston, said spacer being of substantially the same thickness as the difference in lengths between the first section of said second piston and the first section of the concentric bore of said first piston, wherein said piston means defines first and second operating modes,

(a) said first operating mode wherein said spacer is positioned between said first and second piston means so as to mount said second piston flush with the ends of said first piston whereby the effective surface area of the piston means is equal to that area defined by the diameter of said seal means,

(b) said second operating mode wherein said spacer is removed from between said first and second pistons whereby the larger surface area of said first piston and said seal means will enable the fluctuating fluid pressure within said sensing port will induce said first piston and seal means into contact with said valve body at a relatively low level of pressure with respect to that level of pressure required to move said second piston upward into contact with said valve element in opposition to said means for urging said valve element into its first position and wherein the effective surface area of said piston means is reduced to that of the second end of said second piston,

the presence or absence of said spacer means determines the range within in which said piston means is enabled to shift said valve element from said first position to said second position.

4,420,012

DEVICE FOR USE IN CONNECTION WITH TAPPING OFF FLUID FROM OR FILLING FLUID INTO A CONTAINER

Erik J. H. Aström, Tyresö, Sweden, assignor to Tekno-Detaljer Sture Carlsson AB, Vallingby, Sweden

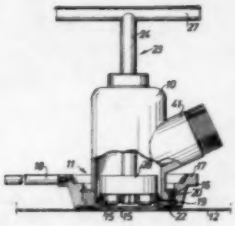
PCT No. PCT/SE80/00054, § 371 Date Nov. 2, 1980, § 102(e) Date Oct. 31, 1980, PCT Pub. No. WO80/01796, PCT Pub. Date Sep. 4, 1980

PCT Filed Feb. 28, 1980, Ser. No. 201,409

Claims priority, application Sweden, Mar. 2, 1979, 7901893

Int. Cl.³ F16L *55/10*

U.S. Cl. 137—319 **5 Claims**



1. A device for use in connection with tapping off fluid from or filling fluid into a container through an internally threaded tapping or filling hole provided in a wall of the container and adapted to be closed by means of an externally threaded generally cup-shaped plug having an outwardly open cavity in which an implement may be inserted for rotating the plug, said device comprising a bell-like housing which is adapted to be removably mounted with an open end thereof over said tapping or filling hole and which is provided with an opening through which fluid may be fed into or discharged from the housing, and a tool for manually operating the plug from a position outside the housing, said tool comprising a shaft which extends slidably and rotatably through a portion of the housing opposite to the open end of the housing, handle means provided at an outer end of said shaft, and plug holding means provided at an inner end of said shaft, said plug holding means comprising expansion means insertable into said cavity in the plug, a carrier for said expansion means, said carrier being mounted on the tool shaft, and actuating means for the expansion means, said actuating means being operative to expand the expansion means into frictional contact under pressure with the side wall of the cavity in the plug, characterized in that the carrier (**28**) for the expansion means (**33**) is mounted for limited movement on an inner end portion of the tool shaft (**24**), while the actuating means (**39**) for the expansion means (**33**) are rigidly connected to the tool shaft (**24**).

4,420,013

REGULATOR GUARD

Alfonzo W. DiBiasio, Schenectady, N.Y., assignor to Cedious, Incorporated, Schenectady, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,663

Int. Cl.³ B65D *25/00*

U.S. Cl. 137—382 **4 Claims**

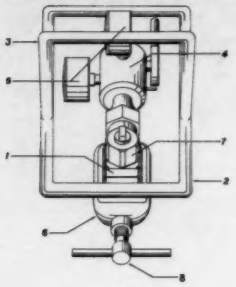
1. A regulator guard for protecting a regulator and gauge assembly joined to a valve head of a gas cylinder, comprising:

a mounting block member with front and rear surfaces having a conical protrusion on said front surface and a corresponding conical depression on said rear surface;

said valve head having a surface with a conical depression therein abuttingly mating with said front surface of said mounting block member such that said conical depression on the valve head mating surface engages said conical protrusion on the mounting block member front surface;

means joined to said mounting block member forming a protective structure for said regulator and gauge assembly;

a yoke securing said regulator and gauge assembly to said valve head, said yoke horizontally circumscribing said valve head and mounting block member abuttingly mated



therewith and tightenable thereagainst by an adjustable screw having a conical front end engaging said conical depression on said rear surface of said mounting block member, whereby said protective structure-forming means are securedly positioned to protect said regulator and gauge assembly from impact damage.

4,420,014

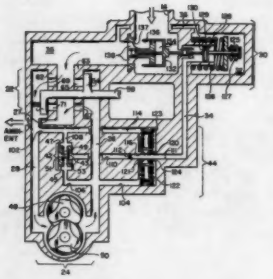
PRESSURE REGULATOR FOR A FLUID MOTOR

Robert R. Riggs, South Bend, and Paulmer D. Hunt, Mishawaka, both of Ind., assignors to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 142,205, Apr. 21, 1980, Pat. No. 4,352,299, which is a division of Ser. No. 952,029, Oct. 16, 1978, Pat. No. 4,249,453. This application Jun. 22, 1981, Ser. No. 276,142

Int. Cl.³ G05D *7/01*

U.S. Cl. 137—468 **2 Claims**



1. A pressure regulator comprising:

a housing having a first chamber separated from a second chamber, said first chamber having an entrance port and an exhaust port, said entrance port being connected to a source of fluid under pressure, said exhaust port being connected to a supply conduit, said second chamber having a first port connected to said supply conduit for receiving a supply pressure signal and a second port connected to receive a variable reference pressure signal, said supply conduit having first and second branches connected to a mechanism, said variable reference pressure signal being a function of the pressure of the fluid supplied to said mechanism, said fluid communication to said first and second branches being controlled by an operator to operate said mechanism in opposite directions;

wall means located in said second chamber for separating said first port from said second port, said supply pressure signal and said variable reference pressure signal creating a pressure differential to move said wall;

resilient means connected to said wall for opposing movement by said pressure differential;

valve means connected to said wall for changing the flow characteristics from said first chamber into said supply conduit as a function of the movement of said wall means;

temperature compensator means connected to said wall means for modifying the force of said resilient means to assure that the pressure differential required to move said wall means is substantially unaffected by changes in temperature; and

pressure relief means connected to said second port to limit the variable reference pressure signal and thereby prevent the delivery of a predetermined fluid flow into said supply conduit that could damage said mehanism.

4,420,015

INSTALLATION OF AN EXCESS PRESSURE VALVE IN A HERMETICALLY SEALED FLEXIBLE CONTAINER

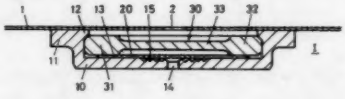
Hans U. Blaser, Flurlingen, Switzerland, assignor to SIG-Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Dec. 30, 1981, Ser. No. 335,770

Claims priority, application Switzerland, Jan. 7, 1981, 70/81

Int. Cl.³ F16K *15/16*

U.S. Cl. 137—852 **11 Claims**



1. In a safety valve for a hermetically sealed container, which valve includes a carrier plate having a lateral edge flange for fastening the carrier plate to the container and presenting a shallow recess having a base provided with an opening, a flexible diaphragm inserted in the recess and covering the opening, and a viscous sealing agent interposed between the base of the recess and the diaphragm, the improvement comprising a clamping member disposed in said recess and provided with pressing jaws positioned to clamp an edge region of said diaphragm against said base of said recess and a bar connecting said pressing jaws to form a unit therewith and having a lesser thickness than said pressing jaws.

4,420,016

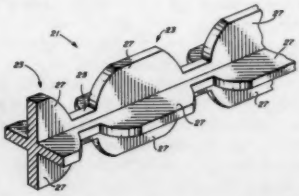
KINK-PREVENTING SPINE FOR AQUARIUM AIR HOSES

Ralph A. Nichols, Box 289, Lee Vining, Calif. 93541

Filed Jan. 7, 1982, Ser. No. 337,579

Int. Cl.³ F16L *11/12*

U.S. Cl. 138—103 **9 Claims**



1. A device for preventing kinks in air hoses for aquariums comprising:

a plurality of rib members each having a plurality of radially disposed ribs;

means extending between adjacent ribs for attaching the center of each of said rib members to the center of an adjacent one of said rib members, said means for attaching being substantially flexible under bending stresses; and wherein

said rib members and said attaching means are integrally formed from a flexible extruded plastic material.

4,420,017

ENERGY CONDUIT SUPPORT

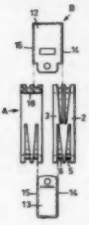
Werner Moritz, Siegen, Fed. Rep. of Germany, assignor to Kabelschlepp Gesellschaft mit beschränkter Haftung, Siegen, Fed. Rep. of Germany

Filed May 4, 1981, Ser. No. 260,666

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040076

Int. Cl.³ F16L *11/18*

U.S. Cl. 138—120 13 Claims



1. In an energy conduit support between a movable consumer and a stationary connection comprising narrow tubular members with outwardly directed outer abutment stops and wide tubular members with inwardly directed abutment stops which engage behind each other, respectively, said members can be bent at an angle only in one direction with respect to one another, said members having top and bottom central regions and two arms therebetween, the narrow tubular members respectively having in a transverse central plane thereof a central outwardly directed abutment stop ring defining grooves, respectively, on both sides thereof towards the outer abutment stops and adapted for engagement of the inwardly directed abutment stops on the wide tubular members, the wide tubular members each being shortened in a longitudinal direction of the support on both sides, respectively, in the vicinity of a longitudinal cross-sectional half of the support by approximately the width of one of the grooves, respectively, and comprising two tubular member halves which can be placed over the narrow tubular members, said two tubular member halves constituting a wide tubular member half substantially above an axial neutral axis of the conduit support and a narrow tubular member half substantially below the neutral axis, the improvement wherein

the central outwardly directed abutment stop ring of each of the narrow tubular members has:

parallel flanks in a vicinity of the wide tubular member halves, and

diverging flanks which extend apart in a direction towards the neutral axis on both arms in the vicinity of the narrow tubular member halves,

the outer abutment stops of each of the narrow tubular members have facing:

converging flanks on both arms in the vicinity of the wide tubular member halves, said converging flanks taper towards the central outwardly directed abutment stop ring in a direction towards the neutral axis, and parallel flanks in the vicinity of the narrow tubular member halves.

4,420,018

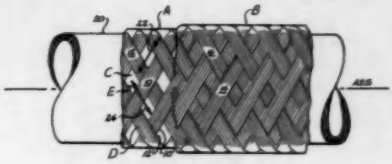
POLYPHASE BRAID REINFORCED HOSE

Thomas C. Brown, Jr., 492 Hodges Dr., Orangeburg, S.C. 29115

Filed Apr. 28, 1982, Ser. No. 372,612

Int. Cl.³ F16L *11/00*

U.S. Cl. 138—124 7 Claims



1. A tubular braid reinforced hose comprising:

a tubular member;

a plurality of courses of braided reinforcing wires covering said tubular member;

each said course comprising at least two groups of reinforcing wires braided with one another;

a first of said groups of wires having a helically wrapped orientation in a generally clockwise direction;

a second of said groups of wires having an opposite helically wrapped orientation in a generally counter-clockwise direction;

each said group including a plurality of reinforcing wires oriented generally side-by-side defining a generally single layered band having a width defined by outermost edge wires;

adjacent windings of each of said groups of wires being spaced apart from one another defining crimp reducing braid spaces through which windings of the helically opposite group of wires cross to interlace over and under said adjacent windings of the other of said group of wires in a first braided structure;

a first underlying course next adjacent said tubular member having first and second groups of wires covering no more than substantially one-half of the available strand space of said tubular member so that adjacent windings define crimp reducing braid spaces having a sufficient width to enable said windings of crossing over groups of wires to undergo less bending when interlaced with said spaced apart adjacent windings and thereby reduce the crimp of edge wires of said adjacent windings crossed thereover;

said first and second groups of wires of said first underlying course interlaced over and under each other in braided structure defining distinct open unoccupied spaces between adjacent windings of said groups of wires, in which portions of the surface of said tube are substantially exposed;

a number of overlying braided courses of said first and second groups of wires braided with one another in phase shifted relationship with respect to a next adjacent underlying course so that the wires of said overlying courses substantially occupy the open unoccupied spaces of said first underlying course so that the available wire space on said tubular member is substantially covered by said wires with reduced crimping of said edge wires at points of interlaced windings of said groups;

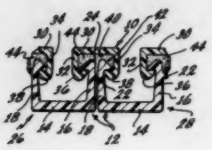
said overlying course of groups of wires being applied at a point of lay downstream of corresponding edge wires of said next adjacent underlying course in said phase shifted relationship generally within said space; and

said overlying course being braided with sufficient tension to enable wire windings of said groups of wires of said overlying courses to fit and interlock in said open unoccupied spaces of said next underlying course providing integral multi-course braided reinforcing fabric structure.

4,420,019
FLEXIBLE, NON-KINKABLE HOSE AND METHOD FOR MAKING THE SAME

Joseph C. Dillon, 12317 Rochedale La., Los Angeles, Calif. 90049

Filed Apr. 5, 1982, Ser. No. 365,361
Int. Cl.³ F16L 11/11
U.S. Cl. 138—129 14 Claims



1. A flexible hose comprising:

an elongated flexible channel member having a generally U-shaped cross section comprised of first and second walls integrally formed with a base, each of said first and second walls having an end distal from said base, said first wall including a rib projecting outwardly therefrom proximate to said end of said first wall and running the length of said first wall generally parallel to said base, said channel member being wound in a substantially helical configuration with said first and second walls being adjacent to one another in adjacent wraps, said rib being in contact with said second wall of an adjacently wound wrap at a location proximate to said end of said second wall; and

an elongated cap member having a generally U-shaped cross section forming an inverted generally U-shaped cavity, said cap member being wound with said channel member, said ends of said first and second walls of said adjacent wraps being received in said inverted generally U-shaped cavity, said cap member and said ends of said first and second walls of said adjacent wraps being bound together in said U-shaped cavity by an initially flowable binding material, whereby said first and second walls of said adjacent wraps are separable and flexible below said rib.

11. A flexible hose comprising:

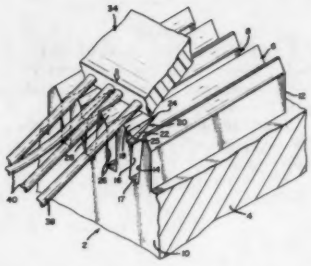
an elongated flexible channel member having a generally U-shaped cross section comprised of first and second walls integrally formed with a base, said channel member being substantially helically wound with a first wall of a first wrap of said channel member being adjacent to a second wall of an adjacent wrap of said channel member, said first and second walls extending radially outwardly from said base; and

an elongated cap member having a generally U-shaped cross section forming an inverted generally U-shaped cavity, said cap member being wound around said channel member, the radially outermost portions of said first and second walls of adjacent wraps being received in said inverted generally U-shaped cavity, said cap member and said radially outermost portions being bound together into a solid body by an initially flowable solidified in situ binding material, adjacent surfaces of said first and second walls of adjacent wraps being free of said binding material radially inwardly from said cap and said radially outermost portion, said first and second walls radially inwardly from said radially outermost portion and said cap being separable and flexible without significant flexing of said cap member.

4,420,020
WIRE COMBING DEVICE

James E. McGeary, and Walter C. Shatto, Jr., both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 157,780, Jun. 9, 1980, abandoned. This application May 7, 1982, Ser. No. 376,071
Int. Cl.³ B21F 1/02
U.S. Cl. 140—147 12 Claims



1. A combing device for transposing a pair of axially adjacent conductors into a modified axial relationship, comprising:

support block means having at least one profiled channel extending downwardly into a top surface thereof, said channel being defined by parallel sidewalls spaced apart to closely admit the diameter of one of said conductors, and said channel extending from a forward conductor receiving end of said support block means to a rearward conductor-nesting end;

one of said sidewalls having an upper longitudinal surface adapted to flare outwardly to said block means top surface;

said upper flared sidewall surface having a tapered profiled cut therein defined by a side and a bottom surface, said tapered cut extending from said forward conductor receiving end toward said rearward conductor nesting end with said profiled cut bottom surface extending into said upper sidewall portion a decreasing depth therealong.

4,420,021
METHOD AND APPARATUS FOR FILLING OF FLEXIBLE CONTAINERS

Olaf Strand; Bjarne Omdal, both of Porsgrunn, and Jens Svendsen, Hosle, all of Norway, assignors to Norsk Hydro A/S, Oslo, Norway

Filed Oct. 5, 1981, Ser. No. 308,854
Claims priority, application Norway, Dec. 16, 1980, 803784
Int. Cl.³ B65B 1/06
U.S. Cl. 141—10 9 Claims

1. A method of filling bulk material into an inner bag of a flexible container of the type having plural lifting loops, said method comprising:

hanging a first said lifting loop on a hook;

inserting a bulk material filling pipe into an opening in an upper portion of said inner bag;

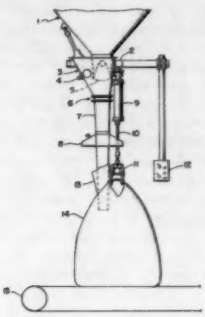
hanging a second said lifting loop on said hook;

raising said hook to a filling position, and filling said inner bag with air, thereby causing said lifting loops to press said upper portion of said inner bag tightly against said filling pipe;

filling bulk material through said filling pipe into said inner bag, while supporting substantially the entire weight of the thus filled flexible container by said hook;

joining said first and second lifting loops together;

lowering said hook until said filled flexible container is not supported by said hook;



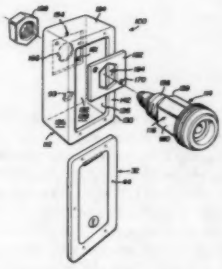
removing said hook from said joined lifting loops; and closing said opening in said inner bag.

4,420,022

LIQUEFIED GAS FILLING DEVICE

George H. Landry, 4669 Pardee, Dearborn Heights, Mich. 48125

Filed Apr. 6, 1981, Ser. No. 251,327
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—18 2 Claims



1. A filling device for a liquefied gas container comprising:

a box-shaped housing mountable on the exterior wall of a support structure, said housing having an interior wall and a receptacle located in said housing for receiving liquefied gas;

said receptacle having a unitary body including an inlet end and an outlet end, said inlet end of said receptacle having means for quick attach-detach coupling with a source of liquefied gas, said outlet end received through an aperture in said housing interior wall, and said outlet end connected to said liquefied gas container;

said receptacle having an inlet passage extending through said inlet end, an outlet passage extending through said outlet end, and an intermediate chamber located between said inlet and outlet passages, a check valve located in said intermediate chamber including a spring-biased poppet, and said poppet permitting one-way flow of liquefied gas from said inlet passage through said intermediate chamber to said outlet passage;

said receptacle outlet end including a threaded end portion which is connectable with said liquefied gas container, an enlarged threaded intermediate portion spaced from said threaded end portion, and a pair of flat surfaces on opposed sides of said threaded intermediate portion;

said housing interior wall aperture and said receptacle intermediate portion providing anti-rotation means for preventing rotation of said receptacle relative to said housing, said housing interior wall aperture including a pair of arcuate ends and a pair of opposed elongated parallel sides interconnecting said arcuate ends, said arcuate ends slidably clearing said receptacle threaded intermediate portion and said opposed parallel sides slidably engaging said receptacle intermediate flat surfaces, and means engaging said enlarged threaded intermediate portion for securing said receptacle against said housing interior wall with said receptacle intermediate flat surfaces engaging said wall aperture parallel sides thereby preventing rotation of said receptacle relative to said housing interior wall; and

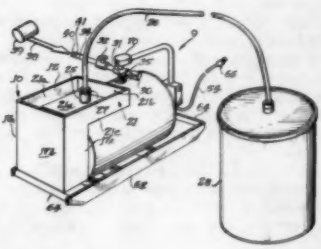
said anti-rotation means preventing loosening of the connection between said liquefied gas container and said threaded receptacle outlet end portion during the coupling or uncoupling between said receptacle inlet end and said source of liquefied gas.

4,420,023

DEVICE FOR COLLECTING HEAVY OIL AND TRANSFERRING IT TO SUITABLE CONTAINER

Raymond S. Cislak, 95 E. Craig Dr., Chicago Heights, Ill. 60411

Filed Mar. 14, 1980, Ser. No. 130,437
Int. Cl.³ B65B *3/26*
U.S. Cl. 141—198 9 Claims



1. A transportable apparatus apparatus for collecting and for transferring heavy viscous liquids, said apparatus comprising:

collecting means to collect the viscous liquid;

a pressure vessel for accumulating and for holding the viscous liquid until air pressure is applied thereto to force the liquid from said vessel; means for venting the pressure vessel to allow viscous liquids to flow therein,

a movable carrier for movement from one location to another having said collecting means and said pressure vessel mounted thereon;

one-way valve means allowing viscous liquids to flow from said collecting means into said pressurized vessel;

level sensing means for sensing the level of liquid in said pressure vessel;

air inlet valve means for connection to a supply of pressurized air and for admitting pressurized air into said pressure vessel;

liquid outlet means for delivering from said vessel a flow of viscous liquid being moved by air pressure; said one-way valve preventing flow of the viscous liquid from said pressure vessel to said collecting means, and

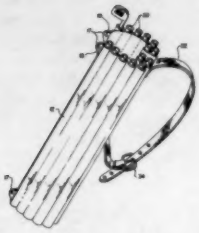
valve means controlled by the level sensing means to close said venting means and to admit pressurized air to flow into said pressure vessel to force viscous liquid in the pressure vessel outwardly through said liquid outlet means, said level sensing means closing said air inlet valve means when said liquid level in said pressure vessel falls below a predetermined level.

4,420,024

GOLF CLUB BAG

Charles R. Clayton, 606 Coolidge St., Midvale, Utah 84047

Continuation-in-part of Ser. No. 194,618, Oct. 6, 1980, Pat. No. 4,334,564. This application Oct. 5, 1981, Ser. No. 308,913
The portion of the term of this patent subsequent to Jun. 15, 1999, has been disclaimed.
Int. Cl.³ A63B 55/02
U.S. Cl. 206—315.4 9 Claims



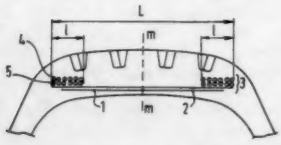
1. A golf bag including:
a plurality of generally elongate receptacles, each of a dimension sufficient to receive the handle of a golf club,
means joining the receptacles together in a generally parallel arrangement and generally in a row, said joining means being flexible,
handle means coupled to said receptacles or joining means to enable holding the receptacles,
fastening means disposed on each of the two endmost receptacles in the row for fastening the two receptacles together to secure the receptacles in a folded configuration,
an additional plurality of generally elongate receptacles, each of a dimension sufficient to receive the handle of a golf club,
means joining the additional receptacles together in a generally parallel arrangement and generally in a row, and
means connecting the additional receptacles to the first-mentioned receptacles in a generally back-to-back relationship.

4,420,025

ANNULAR REINFORCING STRUCTURE OF RADIAL TIRES

Giuliano Ghilardi, Sesto San Giovanni, and Luigi Maiocchi, Vernate fraz. Moncucco, both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Oct. 1, 1980, Ser. No. 192,921
Claims priority, application Italy, Oct. 24, 1979, 26736 A/79
Int. Cl.³ B60C 9/20
U.S. Cl. 152—361 DM 6 Claims



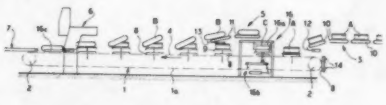
1. A pneumatic tire for vehicle wheels, comprising a radial tire carcass having a crown zone, a tread-band disposed over the carcass in the crown zone, and an annular reinforcing structure disposed between the carcass and the tread-band, said annular reinforcing structure comprising at least two radially superimposed layers of metallic fabric which are substantially as wide as the tread and comprising cords having an elongation at the breaking point of between 2.6% and 3.2%, said cords being parallel to each other in each layer and crossed with those cords of the adjacent layer, and symmetrically inclined with respect to the longitudinal direction of the tire at an angle of between 10° and 30°, and, in a radially external position with respect to said layers, a plurality of superimposed strips of adjacent coils of lang-lay type metallic cords having an elongation at the breaking point between 4% and 8%, disposed parallel to one another and with the equatorial plane of the tire, characterized by the fact that said plurality of superimposed strips comprise reinforcing rings only on lateral portions of said annular reinforcing structure, said reinforcing rings being constituted by at least two radially superimposed strips of said metallic cords, the outer edge of each ring being disposed substantially over the edges of said radially inner layers, the axial width of said rings being between 7% and 40% of the axial width of said annular reinforcing structure.

4,420,026

MACHINE FOR AUTOMATICALLY FITTING TIRES TO RIMS

Pierre A. Goiseau, Verneuil sur Seine, France, assignor to Societe de Mecanique General - Goiseau Guittot, Les Mureaux, France

Filed Oct. 16, 1981, Ser. No. 311,956
Claims priority, application France, Oct. 27, 1980, 80 22959
Int. Cl.³ B60C 25/08
U.S. Cl. 157—1.24 19 Claims



1. A machine for automatically fitting tyres on rims, comprising a continuously driven endless conveyor (1), a first feed device (3) provided at the entrance of the conveyor for placing rims (A) one after the other flat on the carrier side (4) thereof, a second feed device (5) situated downstream of the first one for placing a tyre (B) of corresponding size aslant on each rim, a tyre-fitting head (6) situated downstream of the second feed device for fitting the tyres on the rims, and means (7) for discharging the tyred rims, said machine further comprising adjustment means (16) for automatically and continuously bringing the upper face of the rims (A) to a constant predetermined height with respect to the carrier side (4) of the conveyor (1), before they pass under the tyre-fitting head.

4,420,027

TRANSPARENT ACCESS CURTAIN FOR COOLERS AND THE LIKE

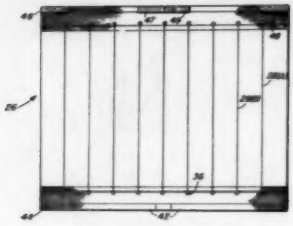
Kenneth N. Gidge, Nashua, N.H., and Henry J. Richard, Lowell, Mass., assignors to BSL Corporation, Nashua, N.H.

Continuation of Ser. No. 287,303, Jul. 27, 1981. This application May 18, 1983, Ser. No. 494,499
Int. Cl.³ A47H 23/01
U.S. Cl. 160—328 12 Claims

1. An access curtain for use over the opening in an open display type refrigerator, or the like, comprising
(a) a sheet of flexible, transparent material of generally rectangular outline,
(b) a pair of strips of flexible, tear-resistant reinforcing material, one strip being joined to an upper portion of said sheet and the other strip being joined to a lower portion of said sheet,
(c) means carried by at least a portion of the upper of said strips and/or by at least a portion of the refrigerator for connecting the upper of said strips to said refrigerator

proximate to the upper edge of said opening, said sheet together with said strips defining a curtain of a length sufficient to span said opening and overhang the lower edge of said opening,

(d) said curtain being formed with a plurality of spaced parallel vertical slits disposed entirely within the outer edges of said curtain, said slits extending through said



sheet and terminating at respective ends within said upper and lower strips,

(e) said slits forming a plurality of substantially coplanar, parallel and integral strip sections arranged in substantially abutting edge to edge relation, and,

(f) means carried by the curtain at the lower edge thereof for applying tension to said curtain.

4,420,028

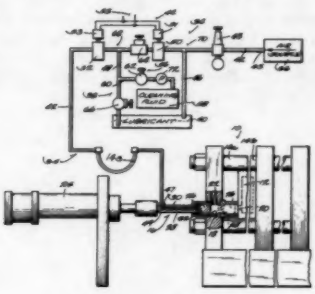
LUBRICATION SYSTEM FOR A DIE CASTING MACHINE

Edward M. Nelson, Greenfield, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 29, 1980, Ser. No. 201,982

Int. Cl.³ B22D *17/20*

U.S. Cl. 164—149 **4 Claims**



1. A die casting machine comprising a die member defining a cavity; a sleeve communicating with said die cavity; piston means operative for reciprocative movement within said sleeve and including a stem portion having a passage communicating with the interior of said sleeve; first means for introducing a stream of pressurized air into said sleeve through said stem portion passage and including an air conduit adapted to communicate with a source of pressurized air, and communicating with said stem portion; second means for introducing lubricant into said air conduit for delivery by the air stream into said sleeve through said stem portion passage, and including a lubricant conduit adapted to communicate with a source of lubricant and operatively connected with said air conduit; control means in said air conduit for selectively controlling air and lubricant flow to said stem portion passage; and third means for selectively blocking the conduction of the air stream by said air conduit and the conduction of the lubricant by said lubricant conduit while introducing cleaning fluid into said lubricant conduit, into said air conduit, and into said stem portion passage, said third means including a cleaning fluid conduit adapted to communicate with a source of cleaning fluid, communicating with said air conduit and said lubricant conduit and including first valve means for selectively controlling cleaning fluid flow through said cleaning fluid conduit, second valve means in said lubricant conduit for selectively blocking said lubricant conduit, and third valve means in said air conduit for selectively blocking said air conduit.

4,420,029

APPARATUS FOR BLOCKING ESCAPE OF HEAT IN HOT SLABS MANUFACTURED ON CONTINUOUS CASTING MACHINES

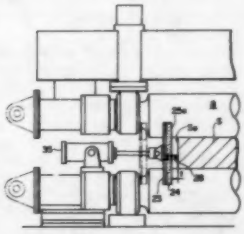
Kazuhide Kameyama, Kawachi-Nagano, and Takahiro Kiyofuji, Sakai, both of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 143,924, Apr. 23, 1980, abandoned. This application Aug. 9, 1982, Ser. No. 406,727

Claims priority, application Japan, Apr. 27, 1979, 54-55902; Jul. 10, 1979, 54-94112; Feb. 25, 1980, 55-21542

Int. Cl.³ B22D *11/128*

U.S. Cl. 164—448 **3 Claims**



1. An apparatus for blocking escape of heat in hot slabs manufactured on a continuous casting machine having a group of top and bottom withdrawal guide rolls positioned one after the other in the longitudinal direction of the cast slab, which apparatus comprises:

at least one heat containing cover on each side of the casting machine extending in the longitudinal direction of the cast slab and facing the side edges of the slab, said heat containing covers each comprising a heat containing plate and a heat-insulating material on the inside surface thereof, and said heat containing cover having a plurality of substantially semi-circular cut-out recesses in the upper and lower portions thereof for fitting around the lower and upper portions of the top and bottom withdrawal guide rolls and visor-like strip members on the upper and lower edges of said covers between adjacent recesses and projecting between adjacent withdrawal guide rolls in a direction parallel to the axes thereof;

a contacting means on said heat containing cover extending toward the side edge of the slab for contacting the side edge of the slab for maintaining a predetermined clearance between the internal surface of the heat containing cover and the side edge of the slab;

means for supporting the heat containing covers for reciprocal movement in the direction of the axes of the withdrawal guide rolls; and

means connected to said heat containing covers for reciprocating said heat containing covers independently of each other for keeping said contacting means in contact with the side edge of the slab.

4,420,030

CONTINUOUS LUBRICATION CASTING MOLDS

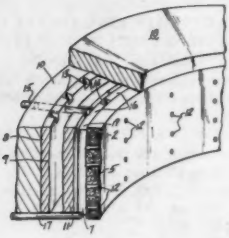
Michael J. Pryor, Woodbridge, and Derek E. Tyler, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 249,761, Apr. 1, 1981, Pat. No. 4,369,832, which is a division of Ser. No. 84,768, Oct. 15, 1979, Pat. No. 4,363,352. This application Jul. 23, 1982, Ser. No. 401,156

The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.

Int. Cl.³ B22D *11/07*

U.S. Cl. 164—472 9 Claims



1. A process for continuously casting molten metals or alloys comprising:

providing a continuous lubrication casting mold, said casting mold including a permeable casting mold section defining an inner casting surface and an outer lubricant receiving surface extending over substantially the entire length of said casting mold section, said casting mold section comprising a porous body having a continuous open pore fraction associated therewith for establishing a first set of passages for a lubricant;

providing a plurality of discrete feed holes extending between said inner and outer surfaces for establishing a second set of passages for said lubricant;

passing said molten metal or alloy through said casting mold section; and

continuously supplying said lubricant to said outer surface so that said lubricant passes through said first and second passages and transfers onto said inner casting surface along substantially the entire length thereof.

4,420,031

METHOD OF CASTING METAL INCLUDING DISINTEGRATION OF MOLTEN METAL

Björn Frykendahl, Erik Dahlbergs Gata 59, 252 40 Helsingborg, Sweden, assignor to Sven Eketorp, Stora Benhamra; Hasse Fredriksson, Bisittargatan; Per Olof Strandell, Bockstigen and Björn Frykendahl, Helsingborg, all of, Sweden

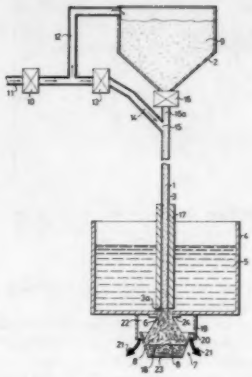
Continuation of Ser. No. 127,896, Mar. 6, 1980, abandoned, which is a continuation of Ser. No. 907,963, May 22, 1978, abandoned. This application Feb. 18, 1982, Ser. No. 350,035

Claims priority, application Sweden, Jun. 8, 1977, 7706696

Int. Cl.³ B22D *11/10, 23/00*

U.S. Cl. 164—473 8 Claims

1. Method for casting molten metal into ingot bars, whereby the molten metal is first disintegrated into fragments by a gas containing a powdered material, after which the resultant mixture of fragmented molten metal and powder is collected, comprising the steps of: providing a container having an outlet in the bottom wall thereof and a lance-shaped tube disposed therein aligned with said outlet; disposing molten metal within said container such that said tube, at its mouth end, is at least partially surrounded by said molten metal; flowing said molten metal from said container through said outlet; pressurizing a supply means containing a powdered metallic material; mixing gas with said powdered metallic material; forcing the gas containing said powdered metallic material through and out said mouth end of said tube, introducing a uniform mixture of the gas and powdered metallic material simultaneously in the center of the molten metal stream flowing from the container outlet, disintegrating the molten metal stream with said gas and powdered metallic material mixture, the quantity of powder mixed with the quantity of molten metal being in a predetermined proportion such that a major portion of the mixture of the powder and molten metal upon disintegration by the gas stream and mixed with the powder, assumes a temperature of at least as much as the solidification temperature of the material mixture, and collecting the resultant semi-solidified mixture of fragmented molten metal mixed with metallic powder grains in a collector.



4,420,032

METHOD OF CONTROLLING THE ENERGY MANAGEMENT OF AN ENERGY SYSTEM AND ENERGY SYSTEM BASED ON SAID METHOD

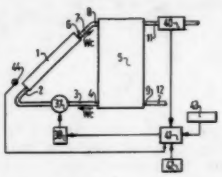
Christianus W. J. Van Koppen, Eindhoven; Onno Rademaker, Knegsel, and Adriaan J. De Ron, Veldhoven, all of Netherlands, assignors to Eurometaal N.V., Zaandam, Netherlands

Filed Feb. 18, 1981, Ser. No. 235,755

Claims priority, application Netherlands, Feb. 19, 1980, 8001008

Int. Cl.³ F28D *17/00*

U.S. Cl. 165—1 4 Claims



1. The method of controlling a heat transfer system so as to yield high efficiency, comprising the steps of:

(a) providing a heat accumulating device having a heat capacity Q_o;

(b) transferring heat by circulating a heat transfer fluid in a loop between an environmental heat transfer device and the heat accumulating device and effecting such circulation so that the temperature of fluid in the accumulating device is highly stratified;

(c) employing the highly stratified heat transfer fluid in the accumulating device to transfer heat at a consumer facility

by circulating the stratified heat transfer fluid between the consumer facility and the accumulating device and effecting such circulation so that stratification of the temperature of the heat transfer medium tends to be retained;

(d) determining the quantity of heat transferred in step (c) over a selected period of time; and

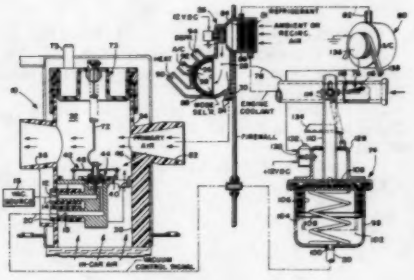
(e) controlling the circulation of step (b) such that the difference between the heat transferred in step (b) over a time period of duration equal to that of said selected period of time and the quantity of heat determined in step (d) is equal to $n(Q_d)$ where n is 0 to 3.

4,420,033

SYSTEM FOR AUTOMATICALLY CONTROLLING VEHICLE COMPARTMENT TEMPERATURE AND TRANSDUCER THEREFOR

Rudolph J. Franz, Schaumberg, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 24, 1980, Ser. No. 190,290
Int. Cl.³ F25B *29/00*; B60H *3/00*
U.S. Cl. 165—26 **18 Claims**



1. A system for controlling the temperature in a vehicle passenger compartment comprising:

(a) compressor means operable upon connection to an on-board source of power for providing a source of refrigerant;

(b) clutch means operable upon activation and de-activation to drivingly connect and disconnect said compressor means with said source of power;

(c) cooler means disposed in heat-exchange relationship with said refrigerant and including means operable to provide heat exchange between said refrigerant and said compartment;

(d) heater means receiving an on-board source of heated fluid in heat exchange relationship therewith, said heater means being operable to provide heat exchange between said heated fluid and said compartment;

(e) heater valve means operable to control flow of heated engine coolant to said heater means;

(f) duct means having said heater means and said cooler means received therein and operable upon receiving a flow of forced air therethrough to direct substantially all of said flow over first one of said heater means and said cooler means and then over the other for providing tempered air;

(g) blower means operable to direct a flow of forced air to said duct means upstream of said heater means and said cooler means;

(h) plenum means receiving said tempered air from said duct means downstream of said heater means and said cooler means and operable to direct said tempered air to said compartment;

(i) sensing tap means operative to divert a minor portion of said duct flow upstream of said heater means and said cooler means;

(j) fluid flow powered transducer means operable upon receiving flow from said sensing tap means to sense the temperature of the atmosphere in the vehicle passenger compartment and, upon connection to a source of fluid pressure, provide a modulated fluid pressure signal indicative of variations in the sensed temperature;

(k) fluid pressure responsive means including a movable actuator member operable in response to certain characteristics of said fluid pressure signal to modulated said coolant valve between no flow and maximum flow and including switch means operable to actuate and de-actuate said clutch means in response to predetermined amount of movement of said actuator member; and,

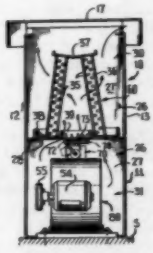
(l) selector means operative upon actuation by the vehicle operator to provide a desired temperature input to said transducer means wherein, upon the operator actuating said selector means, said transducer provides a variable fluid pressure signal such that said fluid pressure responsive means regulates said coolant valve and cycles said compressor for maintaining the passenger compartment at said desired temperature.

4,420,034

HEAT-AUGMENTED HEAT EXCHANGER

Gerry VanderVaart, Niagara Falls, Canada, assignor to Kool-Fire Limited, Niagara Falls, Canada

Division of Ser. No. 87,154, Oct. 22, 1979, Pat. No. 4,311,192, which is a continuation-in-part of Ser. No. 54,647, Jul. 3, 1979, Pat. No. 4,311,191. This application Apr. 30, 1981, Ser. No. 259,356
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—29 **4 Claims**



1. In a heat pump which comprises an inside heat-rejecting means for providing a source to heat an interior space to a selected personal comfort temperature, means for circulating a heat-absorbing fluid in heat-absorbing flow relation to said heat-rejecting means to cool a refrigerant therein, heat-absorbing means, a compressor having an inlet connected to said heat-absorbing means and an outlet connected to said inside heat-rejecting means, conduit means for returning refrigerant from said inside heat-rejecting means to said heat-absorbing means, means for driving said compressor, heat-generating means constituting the sole source of heat for said heat-absorbing means for generating a quantity of heat immediately adjacent said heat-absorbing means which is essentially totally absorbed by the refrigerant in said heat-absorbing means, the quantity of heat generated by said heat-generating means being in amount sufficient to enable the heat-rejecting means to heat the interior space to said selected personal comfort temperature without requiring forced ambient air circulation through said heat-absorbing means, said heat-generating means being disposed generally contiguous and below said heat-absorbing means, said heat-absorbing means being an outdoor coil defining a substantially enclosed chamber, said heat-generating means developing an open flame for directly heating the refrigerant during the passage thereof from an inlet of said outdoor

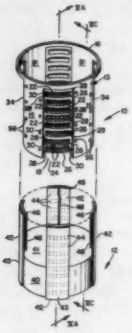
coil to an outlet of said outdoor coil, and said open flame being directed upwardly and substantially entirely into said chamber.

4,420,035

THERMAL CONTROL SYSTEM

Dennis R. Hewitt, Laurel, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 15, 1982, Ser. No. 434,672
Int. Cl.³ F28F *13/00*
U.S. Cl. 165—32 **6 Claims**



1. A thermal control system, comprising:

means (13) having a plurality of exposed surfaces (14) forming an open receptacle wherein adjacent ones of said exposed surfaces are spaced apart by intermediate separations (18) for radiating heat from said exposed surface;

means (42) having channels (67) adjoining corresponding thermally conductive members (64) insertable within said intermediate separations (18) in spaced separation from said exposed surfaces (14) for distributing a stream of a material whose temperature is to be controlled;

means (24) contiguous to said exposed surfaces and connectable to said thermally conductive members for transmitting thermal energy between said thermally conductive members and said exposed surfaces; and

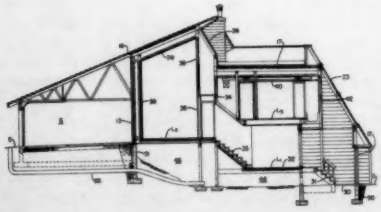
means (54, 56, 86, 90) responsive to the temperature of said material for regulating the effectiveness of said transmitting means inversely to the temperature of said material within said distributing means.

4,420,036

ENERGY EFFICIENT HOUSING STRUCTURE

Lee B. Blaser, 8829 S. William Cody Dr., Evergreen, Colo. 80439

Filed Mar. 19, 1981, Ser. No. 245,585
Int. Cl.³ F24J *3/02*
U.S. Cl. 165—45 **20 Claims**



1. In a building structure having a ground floor, exterior sidewalls and a roof forming an enclosure with room air spaces therein, inner walls spaced inwardly of said exterior walls and roof to define an air circulating envelope therebetween, said envelope being in communication with a lower space beneath said ground floor level and which space is in heat transfer relation to the earth, the improvement comprising

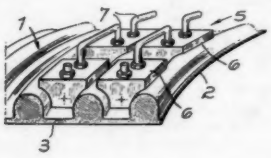
a chase extending upwardly from open communication with said lower space into communication with said air circulating envelope at a point intermediately along the interior of said roof structure, said room air spaces flanking said chase, and vent means between said chase and said room air spaces, at least a portion of one of said exterior sidewalls and roof having a solar energy transmitting panel exposed to solar radiation and in heat transfer relation to said air circulating envelope, said roof including upper and lower roof sections, said clerestory disposed between said upper and lower roof sections exposing an interior portion of said building structure to solar radiation, and air circulating means communicating with said chase and operative to cause the circulation of air in a closed continuous path through said chase, said air circulating envelope and said lower space.

4,420,037

DEVICE FOR COOLING AND CALIBRATING HELICAL THERMOPLASTIC TUBE RIBS

Manfred Hawerkamp, Altenrather Strasse 37, 5210 Troisdorf, Fed. Rep. of Germany

Filed Mar. 30, 1981, Ser. No. 249,156
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1980, 3012295
Int. Cl.³ F28F *7/00*; A21C *3/00*; A23G *1/00*
U.S. Cl. 165—46 **16 Claims**



1. A device for at least one of cooling and calibrating a ribbed tubular wall of a thermoplastic material in a deformable state, the tubular wall having a circular surface and helically extending rib turns projecting from the circular surface at spaced intervals along the surface, comprising a cooling chain of a plurality of interconnected cooling cells mounted between at least two adjacent rib turns, a flexible coolant conduit interconnecting said cells, said cells having means for passing a coolant therethrough for cooling said adjacent rib turns, and said cells having wall portions contiguously engaging said adjacent rib turns.

4,420,038

CLEANING SYSTEM FOR HEAT CONDUCTIVE CONDUITS OF A HEAT EXCHANGER

Isao Okouchi; Sankichi Takahashi; Yasuteru Mukai; Katsumoto Otake; Takuya Sasaki, all of Hitachi, and Masahiko Miyai, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 30, 1981, Ser. No. 279,068
Claims priority, application Japan, Jun. 30, 1980, 55-89702; Jun. 30, 1980, 55-89711
Int. Cl.³ F28G *1/12*
U.S. Cl. 165—95 **5 Claims**

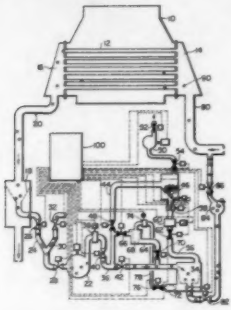
1. A cleaning system for cleaning conduits by circulating resilient balls through the conduits to mechanically remove any incrustations formed on the inner surfaces of the conduits, the cleaning system comprising:

circulating means having an inlet connected to one end of

the conduits and an outlet connected to another end of the conduits for circulating the balls through the conduits,

detecting means for detecting defective balls from among circulating balls and for removing the defective balls out of the circulating means, said detecting means comprising a first counting means capable of selecting and counting the number of defective balls,

means for supplying new balls into said circulating means



including a second counting means for counting the number of new balls supplied by said supplying means,

third counting means for counting the number of balls circulating in the circulating means, and

control means for controlling the number of balls circulating by adjusting the number of balls removed by said detecting means and the number of new balls supplied by said supplying means whereby the number of balls circulating is maintained at a predetermined level.

4,420,039

CORRUGATED-SURFACE HEAT EXCHANGE ELEMENT

Evgeny V. Dubrovsky, ulitsa Chaikovskogo, 18, kv. 203, Moscow, U.S.S.R.

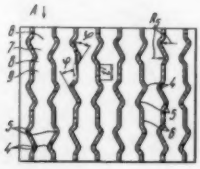
PCT No. PCT/SU81/00005, § 371 Date Oct. 6, 1981, § 102(e) Date Oct. 6, 1981, PCT Pub. No. WO81/02340, PCT Pub. Date Aug. 20, 1981

PCT Filed Jan. 15, 1981, Ser. No. 309,887

Claims priority, application U.S.S.R., Feb. 7, 1980, 2872538

Int. Cl.³ F28F *3/02, 1/22*

U.S. Cl. 165—152 **3 Claims**



1. A corrugated core structure for a heat exchanger, said core structure comprising: a plate having parallel rows of corrugations, the walls of the corrugations defining passages for streams of a heat-transfer agent to flow therethrough, pairs of opposed projections and recesses successively separated by smooth wall portions, the pairs of projections and recesses being arranged in opposition to one another so as to form divergent-convergent portions of the passages and having a length sufficient to intensify the heat transfer process; the smooth portions of the passages alternating with said divergent-convergent portions such that, in combination, they provide for successive throttling of the flow of the heat-transfer agent to intensify the heat transfer process, each said smooth portion of the passage having a length essentially below five values of the hydraulic diameter of said smooth portion in the passage; the vertices of said corrugations being bent on a radius, the value of which is essentially below a difference between one fourth of the pitch of said corrugations and one-half the wall thickness thereof.

4,420,040

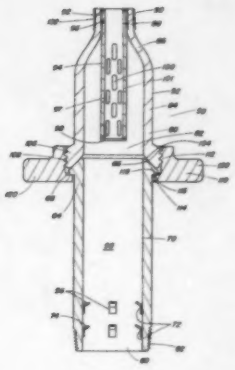
BALL CATCHER

David P. Arbasak, and David L. Blake, both of Weston, W. Va., assignors to Halliburton Company, Duncan, Okla.

Filed May 7, 1982, Ser. No. 375,840

Int. Cl.³ E21B *23/00, 33/068;* **B01D** *35/28*

U.S. Cl. 166—70 **1 Claim**



1. A ball catcher for use in well fluid flow back operations to catch balls used in the hydraulic fracturing of oil and gas wells, the ball catcher comprising:

a separable body housing means having an inlet and outlet thereto, the separable body housing means comprising:

first cylindrical portion means having a conical end surface means and annular shoulder means on one end thereof;

second cylindrical portion means including:

first cylindrical inlet portion means having an inlet and having, in turn, conical end surface means which mate with conical end surface means of the first cylindrical portion means and annular shoulder means thereon;

second cylindrical outlet portion means having the interior thereof formed having threads thereon; and

frusto-conical swedge transition section means having one end secured to the first cylindrical inlet portion means and the other end secured to the second cylindrical outlet portion means; and

threaded nut means releasably securing the first cylindrical portion means to the second cylindrical portion means;

stinger means comprising elongated annular cylindrical member means having a closed end portion, the other end portion having the exterior thereof formed having threads thereon thereby releasably connecting the cylindrical member means to the outlet of the second cylindrical outlet portion means of the second cylindrical portion means of the separable body housing means and a plurality of elongated slot means through the wall of the elongated annular cylindrical member means; and

resilient baffle means secured to the interior of the separable body housing means, the resilient baffle means comprising:

a plurality of resilient baffle means, each resilient baffle means having a first portion secured to the separable body housing means and a second lip portion extend-

ing into the interior of the separable body housing means

whereby said balls in said well fluid flowing back through said ball catcher are caught and substantially retained in the interior of said ball catcher between the stinger means and the resilient baffle means.

4,420,041

METHOD OF USING A VALVE IN GRAVEL PACKING

Dhirajlal C. Patel, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 232,710, Feb. 9, 1981, Pat. No. 4,378,842. This application Nov. 8, 1982, Ser. No. 439,862

Int. Cl.³ E21B *37/08*

U.S. Cl. 166—278 **6 Claims**

1. A method of protecting a well formation during a gravel pack completion operation comprising,

landing in a well a packer with a depending screen and a valve controlling flow through the screen and packer,

maintaining said valve open while utilizing a wash pipe to pack gravel about said screen,

closing said valve in response to withdrawing said wash pipe from the screen,

pulling said wash pipe from the well and running a production string into sealing engagement with said packer,

and opening said valve in response to force exerted through said production string.

4,420,042

METHOD FOR CUTTING AND REPLACING TUBING WITHOUT KILLING WELL

Karl N. Tunstall, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Mar. 5, 1982, Ser. No. 355,183

Int. Cl.³ E21B *29/08*

U.S. Cl. 166—297 **3 Claims**

1. The method of installing and removing a siphon tube from a well comprising:

positioning on a wellhead a stack comprising a sealing and supporting section,

a side mounted wing valve,

a top mounted shut off valve, and

a stripper;

running a siphon tube through the stripper and shut off valve and into the well;

supporting the siphon tube in the stack on the support section;

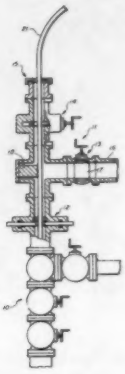
sealing off the annulus between the stack and tubing below the wing valve;

severing the tubing with a tool inserted into the stack through the wing valve;

dressing the upper end of the siphon tube with a tool introduced into the stack through the shut off valve;

introducing through the stripper and shut off valve a pulling tube;

sealingly securing the pulling tube to the siphon tube;



releasing the means supporting the siphon tube and the support-siphon tube annulus sealing means;

and withdrawing the siphon tube through the shut off valve and stripper;

all of the steps of the method being carried out while the well is under pressure control.

4,420,043

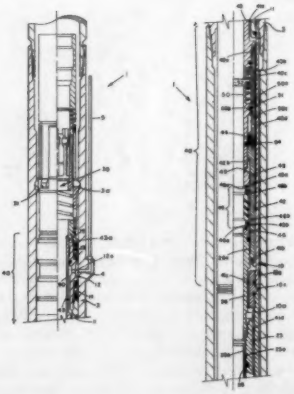
VALVING APPARATUS FOR SELECTIVELY SEALING AN ANNULUS DEFINED BETWEEN A WORK STRING AND THE BORE OF AN ELEMENT OF A PRODUCTION STRING OF A SUBTERRANEAN WELL

Robert T. Brooks, Kingwood, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jun. 25, 1981, Ser. No. 277,572

Int. Cl.³ E21B *34/10*

U.S. Cl. 166—319 **16 Claims**



1. A valve for an annulus defined between a tubular work string and a surrounding annular portion of an operative element of a production string of a subterranean well comprising: an annular valve body shiftably and sealably mountable in the

bore of said annular portion for generally radial movements into and out of sealing engagement with the exterior of said tubular work string; resilient piston means urging said annular valve body into said sealing engagement; and means responsive to a control fluid pressure opposing said resilient means to permit said annular valve body to shift to its non-sealing position relative to said tubular work string upon the application of a predetermined control fluid pressure to said piston means.

4,420,044

FLOW CONTROL SYSTEM

William H. Pullin, Dallas, and Olen R. Long, Celina, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Aug. 19, 1982, Ser. No. 409,511
Int. Cl.³ F21B *33/00*
U.S. Cl. 166—322 **2 Claims**

1. A flow control system comprising; a mandrel having a flowway, a valve seat across said flowway, and means in said mandrel for receiving a retrievable valve in said means; a control valve comprising, a body, a pressure dome in said body, a piston slidable in said body and exposed to pressure within said dome on one side and to pressure exterior of the body on the other side, resilient seal means between said piston and body, said body and piston having cooperable means for alternately latching said piston in retracted position and permitting said piston to extend in response to external pressure conditions, a valve member carried by said piston and having a seal area cooperable with said valve seat to control flow through said flowway, said member having a fluid passageway communicating with the exterior of the valve member on opposite sides of the valve member seal area, a frangible disc sealing said fluid passageway, and cooperable split ring and shoulder means carried by said body and piston engaging when said valve means is extended to lock said valve member in extended position.

4,420,045

DRILL PIPE TESTER AND SAFETY VALVE

Michael E. McMahan, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed May 3, 1982, Ser. No. 373,949
Int. Cl.³ E21B *34/12*
U.S. Cl. 166—334 **19 Claims**

1. A pipe tester valve, comprising:

a housing having a first end adapted to be connected to a string of pipe, having a flow passage therethrough having a first annular interior abutting surface and having a plurality of lug means located on the interior thereof below the first annular interior abutting surface;

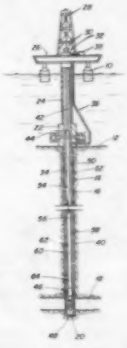
a spherical valve member disposed in said flow passage of said housing;

lug means, attached to said housing, for engaging said spherical valve member and rotating said spherical valve member between open and closed positions wherein said flow passage is open and closed, respectively, as said spherical valve member is moved axially relative to said housing and said lug means; and

moving means for moving said spherical valve member axially relative to said housing between its said open and closed positions, said moving means including:

a lower valve member seat means having a downward facing surface supportably engaged by an upward facing surface of said housing when said spherical valve member is in its said closed position, so that downward forces exerted on said spherical valve member in its said closed position due to fluid pressure in said string of pipe above said spherical valve member are transmitted to said housing through said engagement of said downward facing surface and said upward facing surface;

an upper moving mandrel portion attached to said lower valve member seat means and a lower moving mandrel portion having an upper end adapted for engagement with a lower end of said upper moving mandrel portion and a plurality of lug means located on the exterior thereof slidably engaging the plurality of lug means on

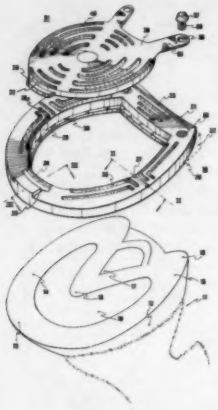


the interior of said housing, so that when a weight of said string of pipe is set down on said housing said lower moving mandrel portion is moved upward relative to said housing and is engaged with said upper moving mandrel portion to move said upper moving mandrel portion upward relative to said housing thereby opening said spherical valve member;

sleeve spring means located between said housing and said lower moving mandrel portion, the sleeve spring means being located in said housing below the first annular interior abutting surface and above the plurality of lug means, the sleeve spring means being constructed so that when said weight of said pipe string is set down on said housing the sleeve spring means is caused to expand by the plurality of lug means on the exterior of the lower moving mandrel portion thereby allowing the lower moving mandrel portion to move upward relative to said housing thereby opening said spherical valve member, and when said pipe string is picked up the end surfaces of the plurality of lug means on the interior of said housing abut an end of said ring spring means causing said sleeve spring means to slidingly move from the plurality of lug means on the exterior of the lower moving mandrel portion as the lower moving mandrel portion is moved to a lower position relative to said housing thereby closing said spherical valve member; and

latch means for latching said spherical valve member in its said closed position as said string of pipe and pipe tester valve are lowered into a well.

4,420,046
PROTECTION DEVICES FOR HORSE SHOES
Jean-Pierre R. Choplin, Jouarre, Seine Marne, France
Filed Jul. 20, 1981, Ser. No. 284,797
Int. Cl.³ A01L *7/02, 5/00*
U.S. Cl. 168—14 **7 Claims**



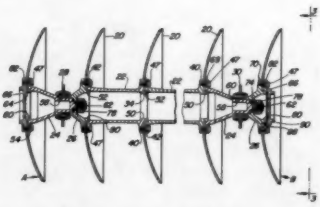
1. Wear appliance of thermoplastic elastomer, preferably polyurethane, for the protection of horse hooves, comprising on the one hand a wear appliance in the form of a strip of material conforming to the contour of the horny portion of the hoof, the rear ends of the strip being united in the area of buttresses of the hoof by a connecting strap so that the strip of material becomes continuous, of generally annular shape, on the other hand, a closure plate attachable in removable manner to the appliance for completely closing the free space located on the inside of the plane of the annulus, the appliance being characterized in that the ground bearing surface of the annular strip and the ground bearing surface of the closure plate are at the same level and that each comprises anti-skid relief sculptures, some longitudinal and some transverse, these sculptures being divided into four separate regions by interruptions, a forward portion on and near the toe, a rearward portion on and near the connecting strap, two lateral portions near the hoof side walls, the sculptures in each region extending principally over the major part of their length parallel or substantially parallel to the edges of the strip and of the closure plate.

4,420,047
STOWABLE FIRE SUPPRESSION SYSTEM FOR AIRCRAFT CABINS AND THE LIKE
Wilhelm A. Bruensicke, Santa Monica, Calif., assignor to Lockheed Corporation, Burbank, Calif.
Filed Dec. 28, 1981, Ser. No. 335,238
Int. Cl.³ A62C *25/00*
U.S. Cl. 169—53 **6 Claims**

1. A fire suppression system stowable within a passenger area of a pressurized cabin of an aircraft in flight comprising:
a supply of water;
a water outlet accessible from inside said passenger area;
booster means for supplying said water to said outlet under pressure;
a mobile fire suppression cart, said cart further comprising:
a flexible water inlet hose;
means for effecting a fluid connection between said inlet hose and said water outlet;
a source of foaming agent;
means for pressurizing said foaming agent;
a double conduit flexible outlet hose having one conduit in fluid communication with said source of foaming agent

and another conduit in fluid communication with said water inlet hose; and
a mixing nozzle connected at one end of said flexible outlet hose for selectively mixing said water, said foaming agent and air to produce a heavy mist of plain water, a relatively dense foam, and a relatively light foam.

4,420,048
DISK GANG ASSEMBLY
Willard E. Peterson, Geneseo, Ill., assignor to Deere & Company, Moline, Ill.
Filed Dec. 10, 1981, Ser. No. 329,546
Int. Cl.³ A01B *23/06*
U.S. Cl. 172—568 **5 Claims**



1. A disk gang assembly, comprising a plurality of disks, a plurality of spacers coaxial with each other and with the disks and respectively interspaced and alternated among the disks to maintain the disks in axially spaced apart relationship, each spacer having opposite end radial flanges disposed so that the flange on one spacer abuts a disk from one side and a flange on the next adjacent spacer abuts the disk from the opposite side so as to sandwich each disk between adjacent flanges, said discs respectively having like-dimensioned central circular openings and at least one end of each spacer having an annular shoulder projecting axially beyond its flange and into and beyond the respective central opening, each shoulder being dimensioned to relatively closely fit the central disk opening into which it projects, the end of each spacer opposite to that having the annular shoulder being provided with an annular recess into which the adjacent shoulder projects, each recess and shoulder being so dimensioned as to provide a relatively close annular fit, the flanges and the disks having matching bolt holes on axes parallel to the disk and spacer axis, a plurality of threaded securing means cooperative among the bolt holes of adjacent flanges and the sandwiched disks for securing the disks and spacers together as an axially rigid unit, said spacers and disks being arranged in a series in which the last spacer in the series abuts the last disk in the series from only one side, a

coaxial spool arranged at the opposite side of that disk and having a radial flange abutting that side of the disk, said flange having bolt holes matching those of the disk and the last spacer flange, additional securing means cooperating via the flange and disk bolt holes to secure the spool and spacer together with said disk sandwiched therebetween, said spool having a reduced-diameter, coaxial cylindrical bearing portion axially beyond said disk, said bearing portion including an annular abutment means, a bearing carried on the bearing portion and abutting the abutment means, a second spool arranged coaxially with and axially beyond the first spool and having an annular recess carried by the first spool bearing portion and an abutment means abutting the bearing from the side axially opposite to the first-named abutment means, and means securing the two spools together.

4,420,049

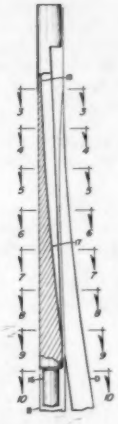
DIRECTIONAL DRILLING METHOD AND APPARATUS

Don R. Holbert, 6637 W. Hinsdale Ave., Littleton, Colo. 80123

Continuation-in-part of Ser. No. 158,237, Jun. 10, 1980, abandoned. This application Jul. 8, 1982, Ser. No. 396,248

Int. Cl.³ E21B *7/08*

U.S. Cl. 175—45 **15 Claims**



12. The method of directionally drilling a bore in a lateral, downwardly curved direction away from a substantially vertical main bore in a subsurface formation, comprising the steps of:

determining the deviation of the main bore from vertical;

positioning a drill string in the main bore having a whipstock with a curved guide surface at the lower end of said drill string, said curved guide surface having a radius of curvature in a longitudinal direction corresponding to the radius of curvature of the lateral bore to be formed and having a concave face in a transverse direction;

compensating for the helixing component of a drill bit advanced along said whipstock in forming said lateral bore;

orienting said whipstock to compensate for lateral deviation of the main bore away from the desired azimuth of said lateral bore and said helixing component of a drill bit as it is advanced beyond said whipstock in forming said lateral bore, followed by

advancing a drill bit along the curved guide surface to drill the lateral bore along the predetermined radius of curvature.

4,420,050

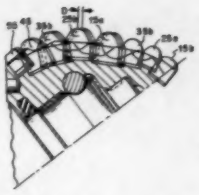
OIL WELL DRILLING BIT

Kenneth W. Jones, Kingwood, Tex., assignor to Reed Rock Bit Company, Houston, Tex.

Continuation of Ser. No. 62,260, Jul. 30, 1979, abandoned. This application May 18, 1981, Ser. No. 264,885

Int. Cl.³ E21B *10/16*

U.S. Cl. 175—374 **4 Claims**



1. A roller cutter for a rotary drill bit of the type having a plurality of bearing journals and roller cutters at its lower end and used to drill well bores in relatively tough formations which tend to form annular ridges on the well bore bottom which hold the drill bit in a pattern of rotation about other than its geometric centerline, the roller cutter comprising:

a generally frustoconical cutter body having a recess in the base thereof adapted to receive a bearing journal, and a plurality of bores of generally circular shape in transverse section in the conical outer surface thereof; and

a plurality of elongate cutting elements of a tungsten carbide material, one for each of said bores, each cutting element having a generally cylindrical base portion secured in the respective bore and a portion projecting outwardly from the roller cutter body, said projecting portion when viewed in section on a longitudinal central plane of the cutter body presenting opposing sides tapering to a generally blunt tip engageable with the bottom of the well bore, the cutting elements being arranged in a plurality of generally annular rows around the cutter body, a first row being adjacent the base of the roller cutter body and constituting a gage row, and a second row being between the gage row and the apex of the cutter body and constituting an intermediate row, the cutting elements of said intermediate row being spaced at generally equal intervals around the cutter body with the longitudinal centerlines of the base portions of the cutting elements of pairs of cutting elements in the intermediate row being spaced apart a predetermined offset distance in the direction of the longitudinal axis of the cutter body, with said offset distance being less than the radius of the base portion of a cutting element, and with the blunt tips of one cutting element of a pair of adjacent cutting elements being in overlapping relation with the blunt tip of the other cutting element of the pair, when the roller cutter is viewed in longitudinal central section, whereby, upon rotation of the drill bit, the cutting elements of the intermediate row engage the bottom of the well bore over a relatively wide annular area for reducing the thickness and thus the shear strength of any annular ridges forming on the well bore bottom and thus the capability of such ridges for holding the drill bit in an off-center rotation pattern.

4,420,051

WEIGHING APPARATUS

Mitsuru Furuta, and Takeo Nakashimizu, both of Shiga, Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

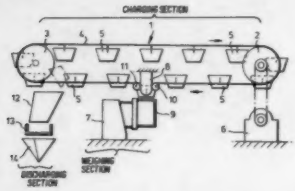
PCT No. PCT/JP81/00017, § 371 Date Oct. 1, 1981, § 102(e) Date Oct. 1, 1981, PCT Pub. No. WO81/02204, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 26, 1981, Ser. No. 308,547

Claims priority, application Japan, Feb. 1, 1980, 55-11615

Int. Cl.[3] G01G *19/22, 13/00, 19/00*; B65G *37/00*

U.S. Cl. 177—25 8 Claims



1. A weighing apparatus comprising a plurality of transfer and weighing lines each consisting of a bucket conveyor having a plurality of buckets for transferring objects to be weighed, and a weighing unit for weighing the buckets with objects held therein, said apparatus being adapted to drive the bucket conveyors to successively weigh the object held in the buckets, store a predetermined number of measured weight values of the objects for each line, and compute a desired or predetermined number of combinations of the stored weight values to obtain a combination which provides a preset weight or a value nearest thereto.

4,420,052

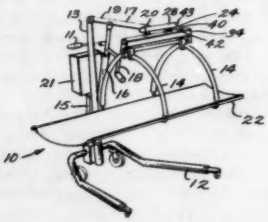
PATIENT WEIGHING SCALE

David C. Hale, Wheaton, Ill., assignor to Scale-Tronix, Inc., Wheaton, Ill.

Filed Aug. 27, 1980, Ser. No. 181,836

Int. Cl.[3] G01G *19/52, 19/14, 21/22*

U.S. Cl. 177—132 11 Claims



1. A scale for weighing a patient in a longitudinally extending stretcher while mounted to a cantilever boom comprising:

(1) a housing longitudinally extending in the horizontal plane;

(2) means, mounted to said housing, for mounting said housing to said boom so as to be pivotable about a first longitudinal axis;

(3) transducer means for measuring bending moments about a transverse horizontal axis, mounted in said housing, said transducer means having a second longitudinal axis and extending longitudinally in the horizontal plane;

(4) means, pivotally mounted to opposite ends of said load cell, for mounting said stretcher to said load cell so as to be pivotable about a third longitudinal axis parallel to said first horizontal axis thereby assuring that the full weight of the patient is directed vertically downward without effecting the orientation of said transducer means.

4,420,053

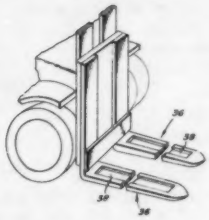
FORK LIFT WEIGHING APPARATUS

Frank J. Russo, Warren, Ohio, assignor to Litco International Inc., Vienna, Ohio

Filed Aug. 20, 1981, Ser. No. 294,781

Int. Cl.[3] G01G *19/08, 23/06*

U.S. Cl. 177—139 3 Claims



1. A fork lift assembly having a plurality of load supporting tines, and each tine being provided with weighing means, the improvement comprising a tine having an elongated cavity therein, weighing means supported in said cavity, the over all height of said weighing means being only slightly greater than the depth of said cavity, said weighing means comprises a weigh bridge having an upper surface adapted to receive a load, a shock absorber secured to the bottom surface at each end thereof, and a load cell secured to each end thereof, and fastening means extending through openings in the bottom wall of the cavity for securing said weighing means therein.

4,420,054

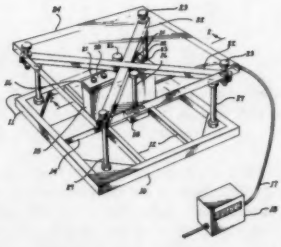
WEIGHING APPARATUS WITH OVERLOAD PROTECTION FOR OFF-CENTER LOADING

Richard F. Caris, Scottsdale, Ariz., assignor to Interface, Inc., Scottsdale, Ariz.

Filed Oct. 23, 1981, Ser. No. 314,166

Int. Cl.[3] G01G *23/02, 3/08*

U.S. Cl. 177—154 1 Claim



1. A weighing instrument which comprises:

(a) a planar frame for engaging a support surface, said frame having a central area for receiving a load cell thereon;

(b) a load cell having a first end including a raised mounting surface and a second opposing end including raised load receiving surface, a portion of said mounting surface engaging the central area of said frame;

(c) a first adjustable stop affixed to the central area of said frame proximate to the first end of said load cell;

(d) a large area weighing platform having a load receiving upper surface;

(e) a plurality of radially extending support arms coupled between the load receiving surface of said load cell and the outer peripheral region of the weighing platform;

(f) a support member extending between two adjacent support arms and overlying a portion of the second end of said load cell;

(g) a second adjustable stop affixed to the support member proximate to the second end of said load cell, said first and second stops residing within a plane orthogonal to the weighing platform;

(h) a pair of overload protectors affixed to the central area of said frame and extending upwardly towards and being spaced from said weighing platform to limit downward movement thereof to a predetermined distance, said first pair residing within a plane which is orthogonal to the weighing platform and to the plane of said first and second stops, each stop and overload protector residing within adjacent quadrants about the load cell to thereby protect said cell from centrally located excess loading of the weighing platform; and

(i) peripheral overload protectors affixed to said frame and extending upwardly towards and being vertically spaced from the peripheral portion of said weighing platform to thereby protect said cell from peripherally located excess loading of the weighing platform.

4,420,055

APPARATUS FOR MEASURING WEIGHT AND FORCE

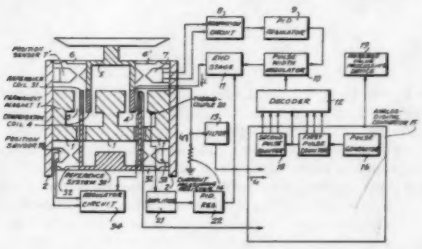
Hartmut Grutzediek, Dresdner Ring 1, 6203 Hochheim; Joachim Scheerer, AmFort Weisenau 38, 6500 Mainz 1; Erich Knothe, Hansenwinkel 4, 3406 Bovenden 1, and Franz-Josef Melcher, Rosenwinkel 18, 3414 Hardegsen 3, all of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 905,020, May 11, 1978, abandoned. This application Aug. 28, 1981, Ser. No. 297,349

Claims priority, application Fed. Rep. of Germany, May 16, 1977, 2722093

Int. Cl.³ G01G *7/00*

U.S. Cl. 177—212 **15 Claims**



1. Apparatus for measuring weight and force, including a weighing and force-measuring system having a fixed part, a load reception part arranged for deflection on the fixed part, a device for providing a constant magnetic field in operative proximity with the load reception and fixed parts, a compensation coil arrangement in the constant magnetic field, and at least one position sensor for ascertaining load-dependent deflections of the load reception part from a predetermined position, said position sensor producing a sensor signal for regulating the current through the compensation coil arrangement so that the load reception part is returned to its predetermined position, said apparatus comprising

a regulator circuit electrically connected to said position sensor and receiving said sensor signal from said position sensor, said regulator circuit including an input electrically connected to said position sensor and an output electrically connected to said compensation coil arrangement, said regulator circuit regulating the current flowing through said compensation coil arrangement to return said load reception part to its predetermined position and to alternately impart positive and negative values, determined by the loading, to the current flowing through said compensation coil arrangement,

wherein said regulator circuit imparts the same maximum amplitude to the positive and the negative values of the current flowing through the compensation coil arrangement, after cessation of current variation due to a change of direction of said load reception part.

4,420,056

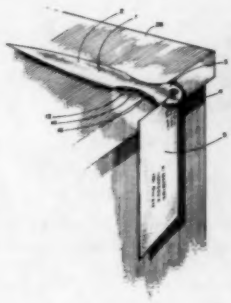
POSTAGE SCALE

Lloyd Chapman, 1758 Fleetwood, Boulder City, Nev. 89005

Filed Feb. 22, 1982, Ser. No. 351,118

Int. Cl.³ G01G *19/54*

U.S. Cl. 177—245 **1 Claim**



1. A scale/letter opener device comprises an elongate, generally flat body member, a handle portion, a blade portion,

grip means for holding a thin, flat article comprising a transverse slot extending from an edge of the handle portion to a central portion of the handle portion, and a bore through said handle portion at the termination of the slot, the slot intersecting the bore at approximately a centerline bisecting the device lengthwise, the slot having a mouth portion located at the edge of the device and a frictional gripping portion, said mouth portion having an opening substantially larger than the grip portion and serving as guide means for intersecting an article into the slot, and

a plurality of transverse ribs extending substantially across the width of the body member on each side of the body member located at differing distances from the grip means along the body member, and wherein the ribs located closer to the grip means are greater in height than ribs located further from the grip means.

4,420,057

AIR INDUCTION STRUCTURE FOR AN AUTOMOBILE AIR CLEANER

Kazuaki Omote, Fujisawa, and Masayoshi Hayashida, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 20, 1981, Ser. No. 294,808

Claims priority, application Japan, Oct. 31, 1980, 55-155897

Int. Cl.³ B60K *13/02*

U.S. Cl. 180—54 A **4 Claims**

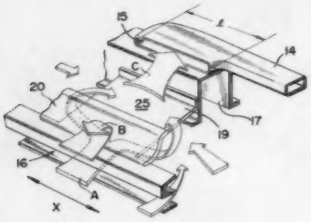
1. An air induction structure for an air cleaner on an automobile, the automobile being furnished with an engine compartment in its front body and a grille at its front end through which the engine compartment is open to the outside to introduce air thereinto, the automobile being also furnished with a pivoted hood for covering the engine compartment from above, the hood being designed to form a gap between the top of the front of the automobile and the hood when the hood is

closed, to draw therethrough air into the engine compartment, the structure comprising:

(a) an air intake duct located in the engine compartment, the air intake duct being connected at one end to the air cleaner and being open forward at its other end to conduct air to the air cleaner;

(b) a first obstructing member extending across a first longitudinally and vertically extending straight path connecting part of the grille and the opening of the air intake duct to block the first path, the first obstructing member extending longitudinally from the upper end of the grille; and

(c) a second obstructing member extending across a second



longitudinally and vertically extending straight path connecting part of the grille and the opening of the air intake duct to block the second path, the second obstructing member extending from the upper end of the grille to the hood when the hood is closed;

(d) the first and second obstructing members defining an air passage in conjunction with the hood when the hood is closed, the air passage being open above both of the sides of the first obstructing member and leading to the opening of the air intake duct so that the air drawn into the engine compartment via the gap and the grille can enter the air passage via both of the openings thereof and be conducted to the opening of the air intake duct through the air passage.

4,420,058

RADIATOR GUARD STRUCTURE FOR VEHICLES

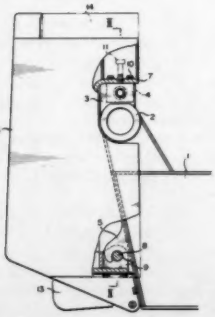
Yoshito Sato, Hirakata; Kazukiyo Chiba, and Minoru Matsumoto, both of Katano, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 22, 1981, Ser. No. 276,083

Claims priority, application Japan, Jun. 25, 1980, 55-88141[U]

Int. Cl.³ B60K *11/04*

U.S. Cl. 180—68 P **4 Claims**



1. A radiator guard structure for a vehicle including an implement and a pair of lift cylinders for the implement, comprising:

a frame of the vehicle;

a pair of lift cylinder supports each for supporting the respective lift cylinders and being fixedly mounted to said frame at an upper end portion thereof;

a pair of hook means each being fixedly mounted to said frame;

a radiator cover detachably mounted to said frame;

a pair of engaging means each being fixedly mounted to said radiator cover at a lower end portion thereof, each said engaging means being adapted to engage with said respective hook means;

a pair of mounting seat structures each being provided at an upper end portion of said radiator cover; and

a pair of resilient mounting means each for mounting said respective mounting seat structures of said radiator cover to said respective lift cylinder supports.

4,420,059

VEHICLE DRIVE SYSTEM

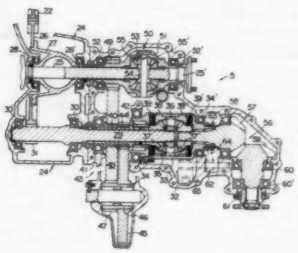
Kunihiko Suzuki, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 30, 1981, Ser. No. 335,679

Claims priority, application Japan, Jan. 9, 1981, 56-2526

Int. Cl.³ B60K *17/04*

U.S. Cl. 180—248 **6 Claims**



1. A vehicle drive system for a vehicle having at least two pairs of road wheels consisting of a pair of front road wheels and a pair of rear road wheels, comprising, in combination,

a power unit having an output shaft having an axis of rotation in a lateral direction of the vehicle,

a power transmission gear unit including transmission input and output shafts each having an axis of rotation in a lateral direction of the vehicle, and gears mounted on the transmission input and output shafts and arranged to be capable of selectively producing a plurality of gear ratios between the transmission input and output shafts, the output shaft of the power unit being operatively coupled to the transmission input shaft, said gears including a transmission output gear rotatable with the transmission output shaft; and

a power distribution gear unit comprising (a) a power distribution shaft having an axis of rotation in a lateral direction of the vehicle, (b) a power distribution input gear having an axis of rotation aligned with the axis of rotation of the power distribution shaft, (c) an intermediate power transfer gear operatively intervening between the transmission output gear and the power distribution input gear and operative to transmit driving power therethrough from the transmission output shaft to the power distribution shaft, (d) a front-wheel and rear-wheel differential gear assembly arranged to be operative to split into two driving power components the driving power carried to the power distribution shaft, (e) a final reduction gear assembly operative to transmit therethrough one of said driving power components with reduction of speed at a predeter-

mined ratio, (f) a pair of drive shafts axially aligned with each other in a lateral direction of the vehicle and operatively connected to one of said pair of front road wheels and said pair of rear road wheels, (g) a wheel drive differential gear assembly mounted on said drive shafts, said final reduction gear assembly operatively intervening between said front-wheel and rear-wheel differential gear assembly and said wheel drive differential gear assembly, and (h) a right-angle power transfer gear assembly operative to a transmit the other of said driving power components to the other of said pair of front road wheels and said pair of rear road wheels, said right-angle power transfer gear assembly including a driven gear having an axis of rotation in a fore-and-aft direction of the vehicle;

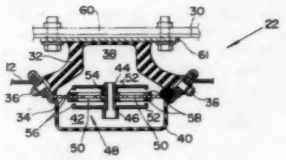
in which said final reduction gear assembly comprises an externally toothed ring gear coaxially rotatable on said power distribution shaft, a first reduction gear held in mesh with said ring gear and rotatable about an axis fixed with respect to and substantially parallel with said power distribution shaft, a second reduction gear coaxially rotatable with and smaller in diameter than said first reduction gear and an externally toothed idler gear held in engagement with said second reduction gear and in driving engagement with said wheel drive differential gear assembly.

4,420,060

ENGINE MOUNT ARRANGEMENT

Toshihiko Kakimoto, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 24, 1981, Ser. No. 257,177
Claims priority, application Japan, May 2, 1980, 55-58963
Int. Cl.³ F16F *9/10*; B60K *5/00*
U.S. Cl. 180—300 **11 Claims**



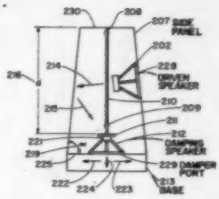
1. In a vehicle:
an engine;
a transmission operatively connected to said engine;
a chassis for supporting said engine and transmission; and
a mounting arrangement comprising:
supporting arms extending laterally from said engine;
elastomeric insulators, one disposed at the end of each of said supporting arms for interconnecting said engine to said chassis, said insulators being adapted to undergo shear and permit said engine to roll about an axis which extends therethrough; and
a mounting device disposed below said engine and interconnecting said engine and said chassis, said mounting device comprising:
a partition connected to said chassis;
a first flexible member mounted on a first side of said partition to define a first variable volume chamber, said first flexible member being connected to said engine;
a second flexible member mounted on a second side of said partition to define a second variable volume chamber, said first and second chambers containing therein a working fluid;
a flow restriction disposed through said partition for fluidly interconnecting said first and second fluid chambers; and
a valve arrangement which closes to increase the flow resistance from said first to said second chamber and from said second to said first chamber in response to a predetermined rate of fluid flow therebetween.

4,420,061

PENTAGONAL SPEAKER ENCLOSURE WITH A DOWNWARD DIRECTED DYNAMIC DAMPING SYSTEM

Michael Levy, 160-15 Powells Cove Blvd., Beechhurst, N.Y. 11357

Filed Nov. 3, 1980, Ser. No. 203,349
Int. Cl.³ H04R *7/24, 1/28*
U.S. Cl. 181—166 **9 Claims**



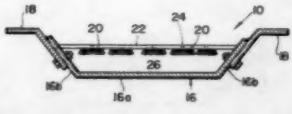
9. A passive damper for subsonic waves comprising:
(a) a downward facing passive speaker cone,
(b) a weight attached to the speaker cone,
(c) an elastic band attached at one end to the weight and extending upwards from the weight,
(d) means for supporting the opposite end of the elastic band at a distance above the speaker cone to support the band which in turn supports the weight and speaker cone in a neutral position and exerts a restraining force on the motion of the speaker cone in the downward direction proportional to the displacement of the speaker cone from the neutral position to prevent the speaker cone from bottoming and thus avoid damaging the speaker cone, where the speaker cone is subject to subsonic waves.

4,420,062

AUTOMOTIVE VEHICLE NOISE REDUCTION DEVICE

Masao Fukushima, Fuchu, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 24, 1982, Ser. No. 391,931
Claims priority, application Japan, Jun. 26, 1981, 56-95559[U]
Int. Cl.³ F01N *1/24*
U.S. Cl. 181—204 **6 Claims**



1. A noise reduction device for an automotive vehicle having an engine and a vehicle body, said noise reduction device comprising:
an under-cover structure fixedly disposed under said engine and including,
a plate member securely connected to said vehicle body,
a plurality of covering members which are spaced from each other and fixedly disposed between said plate member and said engine, and
a sound absorbing material securely attached to each covering member and located opposite to said plate member.

4,420,063

ARRANGEMENT FOR REDUCING THE SUCTION AND/OR EXHAUST NOISES FOR RAPID SPEED COMBUSTION MACHINES

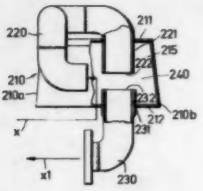
Volker Bohlmann, Hamburg, and Norbert Kania, Hanover, both of Fed. Rep. of Germany, assignors to Sachs-Dolmar GmbH, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 81,333, Oct. 3, 1979, abandoned. This application May 3, 1982, Ser. No. 374,526

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1978, 7829489; Oct. 4, 1978, 7829599; Jul. 28, 1979, 2930668

Int. Cl.³ F02M *35/12;* F01N *1/00*

U.S. Cl. 181—229 4 Claims



1. Apparatus for reducing the intake noise of high-speed internal combustion engines, such as for internal combustion engine-driven chain saws, lawn mowers and light motor cycles, comprising a closed, box-like casing, characterized in that the casing (210) encloses an inner space and is provided with an air intake connection (220) whose outlet end (221) extends through said casing into the inner space (215) of the casing (210) and a carburetor connection (230) whose inlet end (231) extends through the opposite side of said casing into the inner space (215) of the casing (210) and said inlet end (232) faces and is spaced from the outlet end (222) of the air intake connection located in the inner area (215) of the casing (210) accompanied by the formation of a gap therebetween (240) having a dimension in the axial direction of said air intake connection and carburetor connection within said housing corresponding to the range of 50 to 75% of the diameter of the connections (220,230) which have the same diameter.

4,420,064

MEANS FOR LUBRICATING RADIAL SHAFT SEALING RINGS IN GRINDING ROLLS

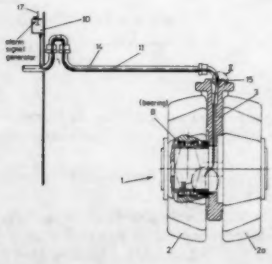
Ludger Lohnherr, Oelde-Sunninghausen, and Walter Holz, Beckum-Neubeckum, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Nov. 21, 1980, Ser. No. 209,010

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1979, 7935481[U]

Int. Cl.³ F16N *29/02;* B02C *15/00*

U.S. Cl. 184—1 C 6 Claims



1. In a grinding roll assembly having a roll carrier on which at least one grinding roll is journaled by bearings and on which a pair of sealing rings is disposed and spaced from one another by a gap, the improvement comprising an air line in communication with said gap, an oil supply, and an oil conduit establishing communication via said air line between said oil supply and said gap.

4,420,065

RAILWAY BRAKES

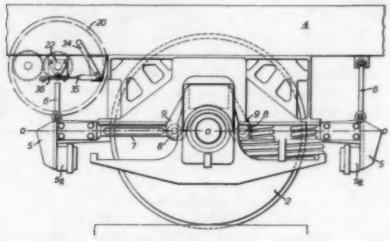
John P. Bayliss, Redditch, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Aug. 19, 1980, Ser. No. 179,534

Claims priority, application United Kingdom, Sep. 7, 1979, 7931225

Int. Cl.³ B61H *13/38*

U.S. Cl. 188—56 4 Claims



1. A tread brake for a railway vehicle including a frame and a wheel having an axis and mounted on the frame by a spring suspension, the brake comprising a braking element comprising an elongate rod of friction material, a power actuator carrying said braking element and operable to drive the rod longitudinally in a substantially radial direction relative to the wheel for applying an end face of said rod against the periphery of the wheel to brake rotation of the wheel, an arm mounting the actuator to said frame for movement relative thereto, said arm being connected to the actuator and directly to the frame by respective pivots both substantially parallel to the wheel axis, a member fixed with respect to the wheel axis, and a rigid link coupling the actuator to said member, said rigid link being immovably fixed to the actuator and being connected to said member by a pivot having an axis substantially parallel to the wheel axis, said rigid link being arranged to move the actuator in response to displacement of the wheel axis relative to the frame so that the actuator applies said end face of the rod against the wheel substantially radially of the wheel axis whatever the position of the wheel axis relative to the frame, said rigid link and said arm mounting said actuator and said rod on the same side of the wheel axis and in the same plane as the wheel.

4,420,066

CAM LOCK SLACK ADJUSTER

Thomas M. Bogenschutz, Clayton, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Sep. 10, 1981, Ser. No. 300,829

Int. Cl.³ F16D *65/54*

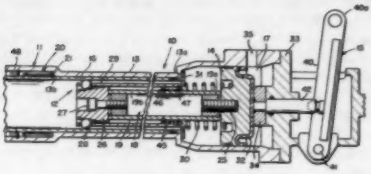
U.S. Cl. 188—107 4 Claims

1. A combined brake actuator, slack adjuster, and lock for railway vehicle brakes comprising, cylindrical brake housing means containing a fluid operable piston and coaxial adjoining hand brake operable means operable to actuate a coaxial tubular push rod for governing application of brakes of a vehicle through slack adjuster means in response to either fluid pressure in a brake cylinder chamber or actuation of the hand brake operable means, wherein improved slack adjusting means is provided for adjustably connecting the piston to the push rod comprising:

(a) actuating rod means having an actuating rod, one end of

which is connected to the piston and the other end of which extends within the tubular push rod for selectively axially actuating the push rod in accordance with axial actuation of the piston,

(b) annular locking means disposed within the tubular push rod secured in part to said other end of the push rod and



operable to selectively operably connect the actuating rod means to the inner periphery of the push rod, and

(c) adjusting means including a friction sleeve on a portion of the outer periphery of the push rod having, restricted free axial movement within the housing for causing axial adjustment of the push rod relative to the actuating rod for automatic slack adjustment for wear in the brakes.

4,420,067

FRICTION MEMBER OF RESIN MOLD TYPE

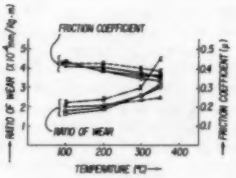
Yasunobu Yamamoto, Chiryu; Ryoichi Tomikawa, and Masami Ishii, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Aisin Kako Kabushiki Kaisha, both of Kariya, Japan

Continuation of Ser. No. 188,265, Sep. 17, 1980, abandoned. This application Apr. 8, 1983, Ser. No. 482,013

Claims priority, application Japan, Sep. 17, 1979, 54-119013

Int. Cl.³ F16D *69/02*

U.S. Cl. 188—251 A **6 Claims**



1. An asbestos-free friction member of the resin mold type consisting essentially of:

10 to 70% by weight, based on the total composition, of brass fiber having a diameter of 0.05 to 0.5 mm and a length of 1 to 10 mm;

6 to 15% by weight, based on the total composition, of phenolic resin as binder agent;

20 to 80% by weight, based on the total composition, of an ingredient improving the frictional qualities selected from the group consisting of rubber dust, cashew dust, graphite, metal sulfide, metal oxide and metal powder; and

less than 30% by weight, based on the total composition, of a filler selected from the group consisting of calcium carbonate and silica.

4,420,068

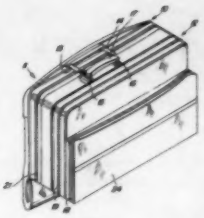
COMBINATION CARRYING CASE AND DETACHABLE GARMENT CARRIER

Edward L. Gerch, Chicago, Ill., assignor to Kingport, Ltd., Evanston, Ill.

Filed Dec. 7, 1981, Ser. No. 328,130

Int. Cl.³ A45C *3/00*

U.S. Cl. 190—102 **6 Claims**



1. In a carrying case of the type wherein flexible material is configured to define a plurality of generally rectangular polyhedral compartments having at least one of an opposed pair of spatially related sidewalls forming at least a portion of a common wall between adjacent compartments, and at least one panel forming a bottom, opposed end walls, and a top for each of said plurality of compartments, each compartment having an opening extending along the top and opposing sidewalls of same with closure means adjacent each opening, means on said case facilitating the carrying of same, and one of said compartments being a substantially hollow primary storage compartment, an improvement comprising:

a second compartment positioned adjacent said first compartment, said second compartment including file means mounted on said common wall between said first and second compartments for segregating any documents positioned in said case,

a third compartment positioned adjacent said first compartment and opposite said second compartment, said third compartment including a plurality of storage compartments mounted on said common wall between said first and third compartments for storing equipment, small documents and the like; and

umbrella storage means positioned in one of said second and third compartments for retention of a collapsible umbrella therein.

4,420,069

AUTOMATIC CLUTCH

Hideyuki Ishiwata, Kawasaki, and Kunihiro Ishino, Yokohama, both of Japan, assignors to Automobile Parts Manufacturing Company Limited, Japan

Filed Aug. 1, 1980, Ser. No. 174,607

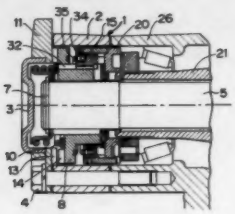
Claims priority, application Japan, Aug. 24, 1979, 54-107820

Int. Cl.³ F16D *11/00, 43/02*

U.S. Cl. 192—35 **1 Claim**

1. An automatic clutch disposed between driven members comprising, on the driving side, a drive clutch movable only axially relative to the driving member and normally biased in a declutching direction, an outer cam located on the side of said drive clutch to which it is biased, said cam being adapted to move in the same way as said drive clutch, with a spring disposed between said outer cam and said drive clutch to bias them away from each other, a stationary inner cam adapted to be connected to or disconnected from said outer cam as said automatic clutch disengages or engages respectively, said inner cam having projections, a holdout ring having projections to be engaged with said projections of said inner cam and adapted to keep said outer and inner cams out of connection when the driving side stops, said holdout ring being fitted over said outer cam under such frictional conditions that, only when said ring

has engaged said inner cam, said ring can rotate relative to said outer cam, and, on the driven side, a driven clutch fixedly mounted on the driven member, said driven and drive clutches



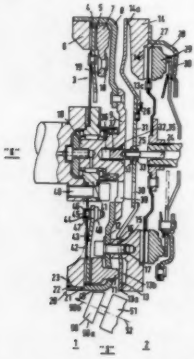
having facing teeth which are engaged upon movement of said drive clutch against its normal bias to engage said automatic clutch.

4,420,070

FRICTION CLUTCH UNIT

Paul Maucher, Sasbach, and Oswald Friedman, Lichtenau, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation of Ser. No. 143,559, Apr. 25, 1980, abandoned.
This application Mar. 2, 1982, Ser. No. 353,873
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 2917138
Int. Cl.³ F02N 5/04; F16D 21/06, 13/44
U.S. Cl. 192—48.8 28 Claims



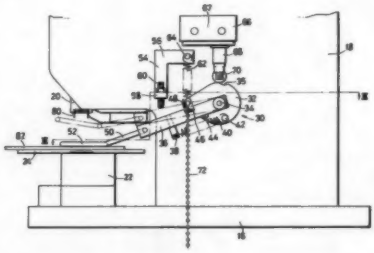
1. A friction clutch assembly, comprising a first shaft, such as the crankshaft of an internal combustion engine; a bearing system having a hub rotatable relative to said first shaft; a first clutch including a flywheel body rotatably supported by said bearing system and being operable to engage said flywheel body with and to disengage said flywheel body from said first shaft, said first clutch comprising first and second pressure plates forming part of said flywheel body, a first friction disc between said pressure plates and having first and second friction linings facing the respective pressure plates, means for non-rotatably connecting said friction disc to said first shaft, means for securing said first pressure plate to said bearing system, said second pressure plate being rotatable with and movable axially relative to said first pressure plate, means for urging said second pressure plate away from said friction disc, a first housing part having a radially inwardly extending portion secured to said hub, and a first diaphragm spring arranged to bias said second pressure plate against the respective friction lining; a second shaft, such as the transmission shaft of a motor vehicle; and a second clutch forming part of said flywheel body and operable to engage said flywheel body with or to disengage said flywheel body from said second shaft, said second clutch comprising an axially fixed first pressure plate, axially extending arms connecting such first pressure plate to said portion of said first housing part, an axially movable second pressure plate, a second friction disc disposed between the pressure plates of said second clutch and secured to said second shaft, a second housing part secured to the first pressure plate of said second clutch, and a second diaphragm spring mounted in said second housing part, the following components of said first and second clutches being adjacent to each other, as considered in the axial direction of said first shaft: (a) the first pressure plate of said first clutch, (b) said first friction disc, (c) the second pressure plate of said first clutch, (d) said portion of said first housing part, (e) said first diaphragm spring, (f) the first pressure plate of said second clutch, (g) said second friction disc, (h) the second pressure plate of said second clutch and (i) said second diaphragm spring.

4,420,071

SAFETY DEVICE FOR MACHINE HAVING FORCEFUL RECIPROCATION

Fumio Seki, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 303,929
Claims priority, application Japan, Sep. 19, 1980, 55-133440[U]
Int. Cl.³ F16P 3/12
U.S. Cl. 192—134 12 Claims



1. A safety device for a forceful reciprocation machine having a frame, a stationary block fixed to the frame and a reciprocating member mounted on the frame, disposed above and in vertically opposed relation to the stationary block, and adapted for vertical reciprocation thereto, said safety device comprising, in combination:

(a) a sensor pivotally mounted at its one end on the frame and having the other end thereof disposed between the stationary block and said reciprocating member for detecting an obstacle on the stationary block;

(b) a plate cam pivotally mounted coaxially with said sensor and having a deflection formed on the peripheral surface thereof;

(c) first means for confining with the stationary block the angular movement of said sensor to a first angular range;

(d) second means for confining the relative angular movement of said sensor and said plate cam to a second angular range;

(e) a first spring for urging said sensor in a first pivotal direction relative to said plate cam;

(f) a second spring for urging said plate cam in a second pivotal direction;

(g) a switch provided beside said plate cam and having a roller adapted for resilient and rolling engagement with the peripheral surface of said plate cam;

(h) activating means for turning said plate cam in the first pivotal direction against the bias of said first and second springs; so that said cam plate and said sensor are turned

coextensively over said first angular range against the bias of said second spring until said sensor reaches the stationary block and thereafter said plate cam alone continues to be turned over said second angular range against the combined biases of said first spring and said second spring, whereupon said deflection is brought into engagement with said roller thereby activating the reciprocating member.

4,420,072

SWITCHING AND CONTROL DEVICE

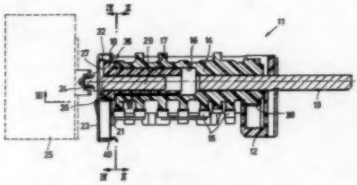
Karl Treffinger, Oberderdingen, and Günther Reimold, Eppingen, both of Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed Apr. 7, 1981, Ser. No. 251,937

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3016032

Int. Cl.³ H01H *9/06;* **H01C** *10/50;* **G05D** *23/00*

U.S. Cl. 192—139 **16 Claims**



1. A switching and control apparatus, comprising:

a stepping switch with a rotatable controller barrel;

a regulator having a rotatable setting shaft drivable by the controller barrel;

clutch means, including a regulator-side coupling member fixed for rotation together with the setting shaft, effective over a predetermined range of angular regulator settings, in which the controller barrel drives the setting shaft, and ineffective at angular settings beyond the predetermined range, during which the setting shaft is not driven by the controller barrel; and,

means for restraining rotational movement of the regulator-side coupling member during movement of the controller barrel beyond the predetermined angular range.

4,420,073

APPARATUS FOR TRANSFERRING ROD-SHAPED ARTICLES FROM A SOURCE OF SUPPLY INTO THE FLUTES OF A CONVEYOR

Nikolaus Häusler, Oststeinbek, and Klaus-Dieter Mallon, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

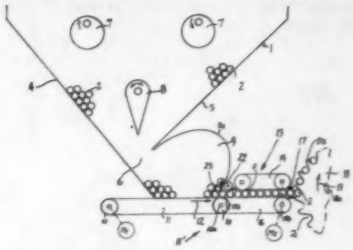
Filed Feb. 27, 1981, Ser. No. 238,675

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1980, 3007880; Dec. 8, 1980, 3046223

Int. Cl.³ B65G *1/00*

U.S. Cl. 198—347 **22 Claims**

1. Apparatus for manipulating rod-shaped articles which constitute or form part of smokers' products and have predetermined diameters, comprising a source of supply of substantially parallel articles, said source having outlet means arranged to discharge articles in such a way that the articles move sideways; a driven withdrawing conveyor having a plurality of article-receiving flutes arranged to move along a predetermined endless path and projections alternating with said flutes and tending to interfere with the admission of articles into said flutes at elevated speeds of said withdrawing conveyor; a transfer conveyor system for delivering articles from said outlet means into successive flutes of said withdrawing conveyor, said system comprising a receiving conveyor arranged to receive articles from said outlet means and to move the articles sideways toward said path, a feeding unit interposed between said receiving conveyor and said path and including a pair of conveyors which define a gap having a width at most equal to said predetermined diameter so that the articles which are delivered by said receiving conveyor form in said gap a single layer successive articles of which are admitted into successive flutes in and substantially radially of said path, and means for driving said receiving conveyor at a speed at least matching the speed of said withdrawing conveyor and



for driving at least one of the conveyors in said feeding unit at a speed exceeding the speed of said withdrawing conveyor; and means defining a pileup zone for articles which have left said outlet means and are about to enter said gap, said pileup zone being located downstream of said outlet means as considered in the direction of travel of articles from said source toward said withdrawing conveyor and said receiving conveyor having first and second portions respectively located below said outlet means and said pileup zone.

4,420,074

CONVEYORS

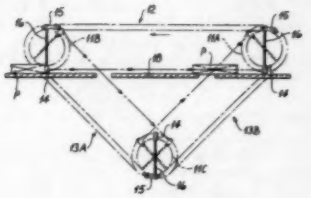
Eric R. Thomas, London, England, assignor to Molins Limited, London, England

Filed Nov. 13, 1978, Ser. No. 960,148

Claims priority, application United Kingdom, Nov. 16, 1977, 47622/77

Int. Cl.³ B65G *19/02*

U.S. Cl. 198—128 **14 Claims**



1. A pusher conveyor comprising an endless flexible band, carried on at least two rotary members having parallel axes of rotation and with pushers fixedly secured to and projecting from said band at regular intervals, the free end of each of said pushers including a pusher surface, said band having a working run extending straight between two of said rotary members, characterized in that each pusher is so formed and secured to an associated portion of the band that while each portion is traveling along the working run each said pusher projects through and beyond a plane containing the axes of said two rotary members at the ends of the working run with said pusher surface located entirely on the side of said plane opposite said working run of said band and spaced from said plane, and so that when each said portion of the band commences to

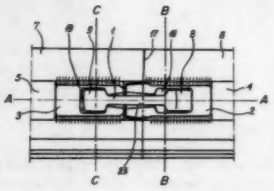
move in an arcuate path around the rotary member at the downstream end of the working run said pusher surface reverses its movement to enter a complementary arcuate path.

4,420,075

CONNECTING MEMBER FOR CHUTES OF CHAIN-AND-FLIGHT CONVEYORS

Wojciech Skolik; Jozef Wodecki; Zenon Gortat, all of Rybnik; Stanislaw Szyngiel, Leszczyny; Andrzej Bulenda, and Piotr Sopora, both of Rybnik, all of Poland, assignors to Rybnicka Fabryka Maszyn Ryfama Przedsiebiorstwo Panstwowe, Rybnik, Poland

Filed Apr. 8, 1981, Ser. No. 252,510
Claims priority, application Poland, Apr. 10, 1980, 223399
Int. Cl.³ B65G *19/28*
U.S. Cl. 198—735 **2 Claims**



1. In combination, a connecting means for chutes of a mining chain and flight conveyor, comprising a locking yoke, mounted to the side wall of the end portion of one of the chutes to be connected together, and a catch yoke fixed to the side wall of the end portion of the second of the chutes to be connected and protruding towards the first chute and beyond the edge of said chute to which it is mounted, and a connecting link, said connecting link being shaped to provide on both ends respective flanged shoulders forming a catch end and a locking end, which connecting link is adapted to be placed in corresponding seats formed in said yokes, said catch yoke having a wall limiting the length of the seat for said catch end and which wall has a substantial inclination increasing the length of that seat towards its inside, said locking yoke having a wall limiting the length of the corresponding seat for said locking end and which wall has a small inclination slightly increasing the length of said seat towards its inside, part of the face portion of said catch end of the connecting link having an inclination of a selected size and convergence which corresponds to the inclination of the catch yoke wall limiting the length of the seat of the catch yoke, said locking end of the connecting link being provided with a through hole having a longitudinal axis which is parallel to the side wall of the conveyor chute, an elastic protective shaped link being mounted by a force fit in said locking end through hole, such that one end part of the elastic link is inserted in the hole while the other part, shaped in a form of hammer head, engages said wall limiting the length of locking yoke seat, the summary total outside length of said seats of the both yokes being smaller than the length of the shaped connecting member.

4,420,076

MOISTURE RESISTANT, QUICK RELEASE PILL CONTAINER

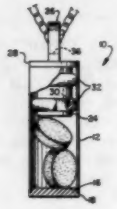
Lois M. Beveridge, 303 Berts Dr., Lothian, Md. 20711, and Harry LaCoste, Kenilworth Towers, Bladensburg, Md. 20710

Filed Jun. 29, 1982, Ser. No. 393,326
Int. Cl.³ A45C *11/00;* **B65D** *83/04, 85/56, 59/02*
U.S. Cl. 206—37 **19 Claims**

1. A nitroglycerin pill holding device for quick, emergency use to permit a user easy, ready access to the pills almost immediately when indications of a pending heart attack occur comprising:

a primary part comprising a cup-like container having an open end with an inner circumference of a predetermined size;

a secondary part comprising an insert having an outer circumference of smaller size than said container inner circumference, and slidable relatively loosely into the open end of said cup-like container;



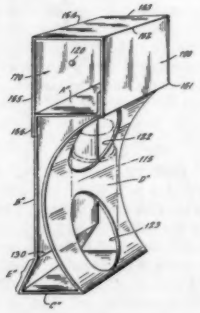
means mounted on said insert for filling the gap between the outer circumference of the insert and the inner circumference of the cup-like container with the dual function of securing the primary and secondary parts securely together and yet rendering them quickly and easily separable by a simple longitudinal pull and also as contaminant excluding structure for protecting pills held within the container.

4,420,077

DISPLAY CARD WITH CONCAVE PANEL

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 196,662, Oct. 14, 1980, Pat. No. 4,362,239. This application Oct. 9, 1981, Ser. No. 309,909
The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.
Int. Cl.³ B65D *5/50*
U.S. Cl. 206—45.14 **2 Claims**



1. A display support for an article of merchandise, said support comprising:

(a) a back wall;

(b) a top horizontal wall;

(c) a bottom horizontal wall;

(d) a concave front wall extending between front ends of said horizontal walls, said concave front wall having at least one opening for supporting merchandise to be displayed on said support, and said concave front wall having a smooth curvature from the front end of said top horizontal wall to the front end of said bottom horizontal wall;

(e) a transverse score line disposed in said back wall, said transverse score line being closer and parallel to the plane of said bottom horizontal wall, said back wall bending at

said transverse score line to maintain the smooth curvature of said concave front wall, said transverse score line being spaced from said bottom horizontal wall a distance E which distance E is determined by the formula:

$$E=[(A+B+C)-D]/2$$

wherein A and C are the lengths of said two horizontal walls; B is the length of said back wall; and D is the length of said concave front wall;

(f) a first panel extending upwardly from an upper edge of said concave front wall;

(g) an upper horizontal panel disposed above said top horizontal wall and extending rearwardly from a top edge of said first panel;

(h) a second panel extending downwardly from a rearward edge of said upper horizontal panel, said second panel overlapping and being adhered to said back wall, said first and second panels and said upper horizontal panel combining with said top wall to providing a substantially rectilinear reinforcing structure providing means for receiving material in addition to the merchandise displayed in said concave front wall.

4,420,078

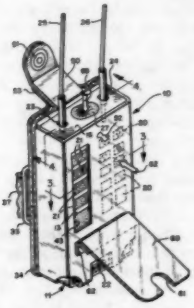
CARRYING CASE FOR A CARDIAC PACER

Kenneth W. Belt, Fort Atkinson, and John S. Mattson, Milton, both of Wis., assignors to Norland Corporation, Fort Atkinson, Wis.

Filed Oct. 30, 1981, Ser. No. 316,780

Int. Cl.³ B65D *85/38*

U.S. Cl. 206—305 **13 Claims**



1. A carrying case for use in conjunction with a portable cardiac pacer having a housing of generally rectangular cross-section having top, bottom, front, rear, left and right side panels, the front and top panels of the housing each including at least one physician-actuable control, said carrying case comprising:

a body portion including bottom, front, rear, left and right side walls and a top rim portion forming an enclosure having an interior cross-section generally corresponding to that of the pacer housing for receiving the housing, the top panel of the housing extending generally to the plane of said rim portion when the pacer is seated in said enclosure;

means including a first flap panel extending from said rear panel to said front panel and over said physician-actuated top panel control, said first flap panel being hingedly mounted to said body portion whereby said flap panel can be hinged away from said rim portion to allow actuation of said top panel control and removal of said cardiac pacer from said enclosure;

means including a second flap panel extending over at least that portion of said front wall corresponding to said physician-actuated front panel control and substantially to said rim portion, said second flap panel being hingedly mounted to said body portion whereby said panel can be hinged away from said front wall to allow actuation of said front panel control; and

user-actuable fastener means for fastening the free ends of said flap panels to each other and to said body portion whereby the cardiac pacer is retained in said enclosure and said physician-actuated controls are protected against inadvertent actuation by applied pressure from the exterior of the carrying case.

4,420,079

CONTAINER FOR TAPE-LIKE MATERIAL

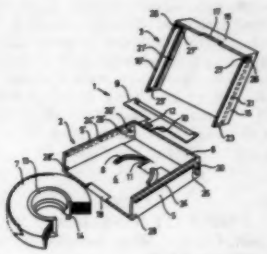
Lothar Gliniorz, Frankenthal; Peter Dobler, Ludwigshafen; Klaus Schoettle, Heidelberg; Joachim Flohr, Viernheim, and Rolf Maerthesheimer, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 20, 1981, Ser. No. 236,501

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1980, 3006864

Int. Cl.³ B65D *85/67, 43/20, 5/64*; G11B *23/02*

U.S. Cl. 206—387 **7 Claims**



1. A container for web-like material, especially magnetic tape wound onto one or two rolls or stored in a cartridge, for operation on a drive mechanism, said container being designed to assume an open or closed condition such that said container, when in its open condition is open for access to said rolls or cartridge by said mechanism both at its front and at its top, and when in its closed condition, is closed all around for protection of the tape or cartridge,

said container having bottom and top parts and means pivotably connecting said bottom and top parts together,

said bottom part having bottom, side and rear walls and means for accommodating the rolls or cartridge, and said top part having at least a top wall with a front wall attached thereto, and

said connecting means having means, including pivots and a set of longitudinal guides on said two parts, respectively, for telescoping, in said open position said top part underneath said bottom part, thereby safeguarding said access at a minimum of space,

wherein the pivots are rotatable and slidable relatively to the guides and, said guides, with said container in telescoped condition, running parallel to said bottom and top walls,

wherein said telecoping means include means for insuring parallelity between said two parts during the telescoping movement, and

wherein a second set of guides which run parallel to the first-mentioned set is provided on one of the two container parts, and guide pins for the second set are provided on the other part, arcuate sections of the second set of guides extending around the pivots, the radius of the arc corresponding to the distance between the pivots and the guide pins.

4,420,080

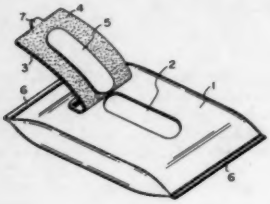
RE-SEALABLE DISPENSER-CONTAINER

Kenji Nakamura, 3-7, Nishiawaji 6-chome, Higashiyodogawa-ku, Osaka, Japan

Division of Ser. No. 210,682, Nov. 26, 1980, abandoned. This application Nov. 12, 1981, Ser. No. 320,554

Int. Cl.³ B65D *81/24*

U.S. Cl. 206—449 **1 Claim**



1. A re-sealable dispenser-container for containing sheet-like fiber material for make-up or toilet use, comprising a main body of the container made of impervious material and having at least one opening, a flap for covering said opening attached to said main body, and an adhesive layer formed on the surface of said flap which surface faces said opening, characterized by:

further comprising a non-adhesive member for covering said opening, said member having a shape similar to and larger than said opening and being disposed on the opening inside of the main body before using the container, whereas after use, said member is drawn out through the opening and attached to said flap.

4,420,081

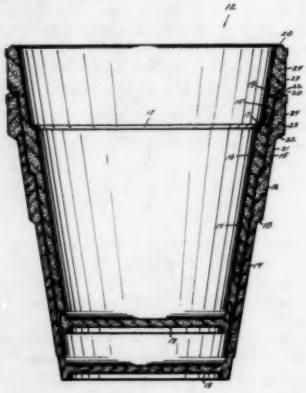
STEP-WALL NESTABLE CUP

Kenneth B. Dart, Okemos, Mich., assignor to Dart Container Corporation, Mason, Mich.

Filed Jun. 22, 1981, Ser. No. 276,016

Int. Cl.³ B65D *21/02*

U.S. Cl. 206—519 **6 Claims**



1. A step-wall nestable cup comprising:

a base portion having an integrally formed sidewall extending upwardly therefrom to terminate at an upper peripheral edge so as to define a container, said sidewall including a first lower inner wall surface tapering upwardly to an outwardly extending inner offset step and a second upper inner wall surface tapering upwardly from said inner offset step, said sidewall including a first lower outer wall surface tapering upwardly to an outwardly extending outer offset step and a second upper outer wall surface tapering upwardly from said outer offset step, said outer offset step being located below and spaced-apart from said inner offset step so as to define an annular thickened portion therebetween.

4,420,082

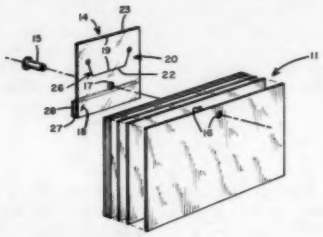
TAB MOUNTED DISPENSER

Jack Bernie, Edina, Minn., assignor to Process Displays Company, North Minneapolis, Minn.

Filed Sep. 3, 1982, Ser. No. 414,585

Int. Cl.³ B65D *85/00;* **G09F** *1/00*

U.S. Cl. 206—526 **4 Claims**



1. A dispenser for presentation and taking of a plurality of sheets on a one-by-one basis comprising:

(1) a plurality of sheets;

(2) a hanger for supporting the plurality of sheets from a price channel having top and bottom flanges or against a vertical surface, the hanger (a) fabricated of flat flexible material, (b) having a channel section and an adhesive section, the channel section having a tab, the lower edge of the tab extending in a straight line parallel to the upper edge of the channel section and spaced from the upper edge of the channel section a distance greater than the vertical distance between the top and bottom flanges of the price channel, (c) the hanger having pressure sensitive adhesive on the rear surface of the adhesive section and having a release liner covering the adhesive;

(3) a pivot linking the plurality of sheets and the hanger, the pivot being connected to the hanger at a point below the tab and being connected to the plurality of sheets at a point along a vertical line which line divides the plurality of sheets into two equal halves so that the hanger can be pivoted from a first position where the channel section is uppermost and the lower edge of the tab and the upper edge of the channel section can be engaged with the price channel to support the plurality of sheets, to a second position where the adhesive section is uppermost and the adhesive can attach the hanger to a vertical surface to support the plurality of sheets.

4,420,083

PILL BOTTLES

Michel M. Baustin, 1066 E. 81st St., Brooklyn, N.Y. 11236

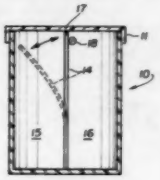
Continuation of Ser. No. 243,885, Mar. 16, 1981, abandoned. This application May 20, 1982, Ser. No. 380,420

Int. Cl.³ B65D *83/04, 85/42*

U.S. Cl. 206—538 **3 Claims**

1. A pill bottle adapted to facilitate dispensing the proper daily dosage of pills from a total supply of pills in the bottle, said bottle comprising an open top container for holding a plurality of pills, removable closure means for closing the open top of said container, and flexible resilient means secured to the interior of said container adjacent the bottom thereof and extending substantially to the top of said container for dividing said container into two separate open ended pill compartments

both of which are accessible when said closure means is removed, said flexible resilient means having edges slightly spaced from the container so that said means can be flexed to close one of said compartments, the spacing of the edges of said resilient means from said container and the top thereof being such that a pill cannot pass from one pill compartment to the other when said closure means is in place, said flexible resilient means being adapted, when flexed, to close one of said compartments and, when released, to return to its initial position to give access to both pill compartments, the arrangement being such that a total supply of pills can be placed in the one of said pill compartments which is closed upon flexure of said flexible resilient means and a daily dosage of the pills placed into the other of said pill compartments from which they are dispensed for use while the other compartment is closed by said flexible resilient means.



4,420,084

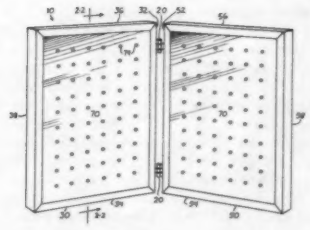
JEWELRY HOLDING DEVICE

Elizabeth M. Whelan, 34631 Sequoia, McHenry, Ill. 60050

Filed May 17, 1982, Ser. No. 378,645

Int. Cl.³ A47F *5/08*; A47B *67/02*; B65D *25/10, 5/52*

U.S. Cl. 206—566 **8 Claims**



1. A device for holding jewelry comprising at least two frames, a jewelry holding means secured within said frames, and a securing means for attaching said frames together in an open display manner or a closed storage manner, said jewelry holding means being a rigid sheet, said frames being substantially thicker than said rigid sheet and said rigid sheet is secured within said frame at about the middle thereof to thereby permit said frames to protect a decorative portion of pierced earrings and a base portion of said pierced earrings or other jewelry.

4,420,085

STAND UP ORGANIZER

Earl D. Wilson, Ingleside, and Martin J. Holmes, Chicago, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Jan. 15, 1982, Ser. No. 339,537

Int. Cl.³ B65D *69/00, 71/00*

U.S. Cl. 206—571 **5 Claims**

1. An organizer for a medical procedure, comprising:

a syringe having a hollow barrel;

an elongated cap releasably attached to a distal portion of the syringe;

a tray having an upper wall, and a syringe recess in said upper wall shaped to frictionally engage and releasably secure a distal end of said cap with the syringe in an upright position, said syringe recess further comprising means defining a plurality of bosses therein, the said bosses frictionally engaging and releasably securing the distal end of said cap therewithin;

an elongated groove defined in the upper wall of said tray for receiving the syringe in a lay-flat condition;

an ampoule having a hollow body portion and a top which may be broken from the body;

an additional, elongated groove defined in the upper wall of said tray for receiving the ampoule in a lay-flat condition; and

an ampoule recess defined in an end of said additional, elongated groove for receiving the body portion of the ampoule with the ampoule in an upright position;

whereby, during a medical procedure, the ampoule top is broken from the ampoule to provide access to liquid contents in the ampoule body portion, the ampoule is placed upright in the ampoule recess, the syringe is placed in an upright position with the distal end of the cap inserted in the syringe recess between the bosses therein, the syringe is removed from the cap, the cap being retained by the bosses of the syringe recess, the syringe is manipulated to withdraw liquid contents from the ampoule hollow body, and, after use of the syringe in a medical procedure, the syringe is again placed in the cap, in an upright position.

4,420,086

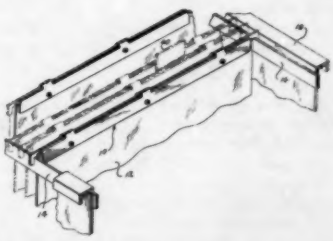
FILING HANGER

Peter G. Bardes, Milwaukee, Wis., assignor to Bardes Products, Inc., Milwaukee, Wis.

Filed Dec. 16, 1980, Ser. No. 217,173

Int. Cl.³ A47B *63/00*

U.S. Cl. 211—46 **8 Claims**



1. A filing hanger for supporting the upper edge of a vertically hanging sheet of material on a pair of spaced horizontal bars, said sheet having a plurality of perforations along the upper edge, said hanger comprising:

a first strap extending across the upper edge of the sheet along one side thereof;

a second strap extending across the upper edge of the sheet along the other side thereof, at least one of said first and second straps having a hook means at each end suitable for engaging one of the spaced bars; and

means mounted on one of the straps extending through the perforations in the sheet for coaction with means on the other of said straps for removably fastening said straps to each other and to the sheet, said fastening means including projections on one of said straps lockingly engaging holes on the other of said straps, each said projection including a circular base having an end section of reduced diameter terminating in an annular ridge, and wherein each said hole in said other strap is sized to lockingly engage said end section and ridge of a projection.

4,420,087

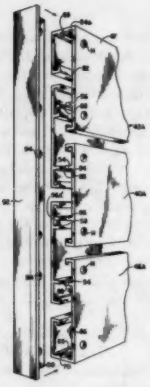
ARTICLE DISPLAY DEVICES

Robert L. Johns, 927 Azalea La., Vero Beach, Fla. 32960

Continuation-in-part of Ser. No. 129,686, Mar. 12, 1980, Pat. No. 4,323,163, which is a continuation-in-part of Ser. No. 116,404, Jan. 29, 1980, abandoned. This application Jan. 2, 1981, Ser. No. 222,246

Int. Cl.³ A47F 5/00

U.S. Cl. 211—189 **20 Claims**



1. A member for use in forming an article display unit which comprises:

a first rectangular web having a length substantially greater than its width,

a second rectangular web having a length substantially greater than its width,

said first and second webs being spaced apart parallel to each other with only a minor portion of the first web overlapping an equivalent portion of the second web,

a third web integral with said first and second webs and perpendicular thereto fixing said first and second webs in said spaced apart, parallel position,

an integral leg element extending laterally from said first web intermediate the longitudinal edges thereof in the direction of said second web,

an integral lug element extending laterally from said second web intermediate the longitudinal edges thereof in the direction of said first web and spaced apart from said leg element,

said leg element being structured to interlock with a portion of a lug element of another of said members.

4,420,088

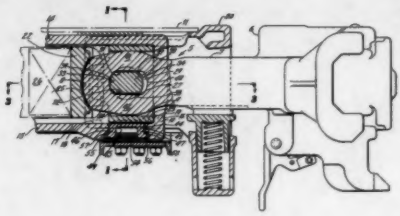
ROTARY RAILROAD CAR COUPLER ASSEMBLY WITH A HORIZONTAL KEY/SLOT ARRANGEMENT

William J. Metzger, Willowick, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Oct. 28, 1981, Ser. No. 315,926

Int. Cl.³ B16G 7/10, 9/20

U.S. Cl. 213—50.5 **14 Claims**



1. A rotary railroad car coupler assembly which, when the coupler is horizontally disposed in a pull or buff position, comprises:

(a) a yoke having a cylindrical opening which extends longitudinally into the yoke from a front end of the yoke closest the head of an attached car coupler;

(b) a rotary connector mounted in the opening of the yoke for rotation about the rotational axis of the yoke, the connector having an opening which extends longitudinally through the connector and which communicates with a pair of horizontally aligned and oblong shaped slots which extend laterally from the opening in the connector, each slot defined by two pairs of oppositely disposed surfaces which are convexly curved outwardly from the center axis of the slot;

(c) means for restricting movement of the rotary connector longitudinally of the yoke;

(d) a car coupler having, a head which protrudes from the front end of the yoke for coupling engagement with another coupler, and a shank which is attached to the head and extends into the opening of the yoke and rotary connector, the shank having a butt end which extends through the opening in the rotary connector for seating engagement against a front follower which is spring loaded in the direction of the coupler head, the shank having a horizontally oblong slot extending therethrough adjacent the butt end thereof in horizontal alignment with the aligned slots in the rotary connector, the slot in the shank having a first pair of generally horizontally disposed surfaces which are connected at their opposing ends by a second pair of surfaces which are convexly curved outwardly from the center axis of the slot, the curvature of said connecting surfaces being complimentary to adjacent similarly disposed and curved surfaces of the slots in the connector;

(e) means for keying the coupler to the rotary connector for unitary rotation, including a key extending horizontally through the aligned slots of the shank and rotary connector, the key having a horizontally oblong cross-sectional configuration which is smaller in area than that of the slots, the key having two pairs of oppositely disposed surfaces which are convexly curved outwardly from the center axis of the key and which are complimentary to the curvature of the adjacent surfaces of the aligned slots of the rotary connector, the one pair of opposing curved surfaces being generally horizontally disposed and designed for rocking engagement with the similarly oriented first pair of surfaces of the slot in the shank to increase the vertical angling of the coupler, the key having a pair of opposing ends which are cylindrically shaped, as distinguished from prior art keys and cylindrical pins which have opposing ends that are flat or spherical.

11. A non-rotatable pin block insertable in the bottom opening of a rotary railroad car coupler yoke to retain a key in the yoke, comprising:

(a) a curved pin block surface designed to be in cylindrical relation with an inner surface of a cylindrical opening disposed in the yoke when the pin block is properly positioned in the bottom opening of the yoke;

(b) a non-circular pin block body including at least two pairs of parallel legs extending from the curved surface of the pin block, the first pair of legs having between their opposing ends a pair of aligned pinholes with identical rectangular cross-sections, the aligned pinholes being aligned with adjacent similarly shaped pinholes in the yoke when the pin block is properly positioned in the bottom opening of the yoke, the second pair of legs terminating at distal ends which have a pair of wings which extend laterally from the pin block into matingly configured recesses that extend laterally from the bottom opening of the yoke, when the pin block is properly positioned in the bottom opening of the yoke;

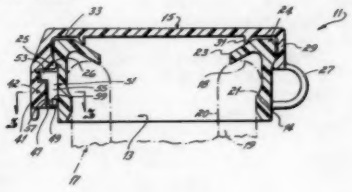
(c) a pin insertable in the aligned pinholes, the pin having a similar, but smaller cross-section than those of the pinholes, the pin coacting with the wings to limit axial movement of the pin block in the bottom opening of the yoke in a direction to and from the cylindrical opening in the yoke, whereby the curved surface of the pin block is maintained in substantial cylindrical alignment with the adjacent cylindrical surface of the yoke.

4,420,089

CONTAINER CLOSURE HAVING CHILD-SAFETY MEANS

Charles B. Walker, 4316 Backmeyer Rd., and Walter L. Holt, Sr., 915 N. 16th St., both of Richmond, Ind. 47374

Filed Jul. 28, 1982, Ser. No. 402,430
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—216 **20 Claims**



1. A safety closure for sealingly closing an access opening of a container, said safety closure comprising:

a cap and a sleeve, said sleeve being adapted to be sealingly secured over said access opening of said container, said sleeve having an open mouth forming an access opening of said closure, said cap being hinged to said sleeve for removably engaging the mouth thereof;

a flap disposed on one side of said cap and hinged thereto;

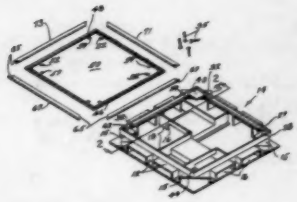
a locking assembly for securing said cap over said sleeve mouth, said locking assembly comprising a female locking element and a male locking element, said female locking element including a pair of spaced edge sections forming a slot therebetween, said female locking element being disposed on one of said flap and sleeve, said male locking element including a ledge section and a projection extending perpendicularly relative to said ledge section, said projection and ledge section being disposed on the other of said flap and sleeve, said flap being movable to urge said spaced edge sections of said female locking element into engagement with said projection of said male locking element so as to dispose said projection in said slot therebetween with said edge sections of said female locking element abutting said ledge section of said male locking element to prevent removal of said cap from said sleeve mouth without first releasing said locking assembly.

4,420,090

JUNCTION BOX

Frank P. Thorpe, Streetsville, and Leslie O. Calhoun, Richmond Hill, both of Canada, assignors to CTS Corporation, Elkhart, Ind.

Filed May 22, 1980, Ser. No. 152,379
Claims priority, application Canada, May 16, 1980, 352079
Int. Cl.³ H02G *3/12*
U.S. Cl. 220—3.7 **7 Claims**



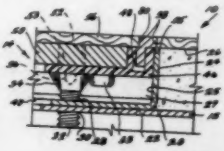
1. A junction box for encasement in concrete and comprising a substantially square box, an outer frame assembly consisting of a base portion and an inner frame assembly, said inner frame assembly being supported on said base portion, means forming a part of said outer frame assembly for abutting against a concrete surface, a plurality of weight carrying adjusting screws received through said base portion of said outer frame assembly to effect selective adjustment of said inner frame assembly relative to said abutting means and the concrete surface, a cover plate forming a part of said inner frame assembly, a header forming part of said inner frame assembly and circumscribed by said outer frame assembly and supported by said weight carrying adjusting screws, said header having a groove about the periphery thereof, and a trim comprising a central shank adapted to be force fitted within the groove of said header, and lateral means also forming a part of said trim and extending around the perimeters of said cover plate and outer frame assembly.

4,420,091

JUNCTION BOX

Frank P. Thorpe, Streetsville, and Leslie O. Calhoun, Richmond Hill, both of Canada, assignors to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 152,379, May 22, 1980. This application Sep. 20, 1982, Ser. No. 419,778
Int. Cl.³ H02G *3/12*
U.S. Cl. 220—3.7 **3 Claims**



1. A junction box for encasement in concrete, comprising a box having duct receiving openings and dividers therein, an outer perimeter assembly including a base section, an outer wall surface of said outer perimeter assembly adapted to abut against a concrete wall and operatively secured to said base section, a plurality of weight carrying adjusting screws each

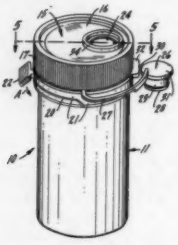
receivable in a respective threaded opening in said base section and disposed in the outer periphery at spaced locations of said base section, an inner cover assembly disposed within the area circumscribed by said outer perimeter assembly and including a header and a cover plate supported by the screws receivable in the base section and said screws selectively adjustable to effect adjustment of said inner cover assembly relative to said outer wall surface and the concrete wall, said header providing support for said cover plate and having a groove at the outer periphery thereof, and a stepped trim provided with a bottom section force fittable within said groove and a top section extending above the top of said inner cover assembly to position a floor covering therewith.

4,420,092

TAMPER-RESISTANT PHARMACEUTICAL VIAL AND CAP ASSEMBLY

Sam D. Finkelstein, Canton, Ohio, assignor to MPL Inc., Chicago, Ill.

Filed Sep. 1, 1982, Ser. No. 413,623
Int. Cl.³ B65D *51/18*
U.S. Cl. 220—254 **10 Claims**



1. In a tamper-resistant pharmaceutical vial and cap assembly comprising an open-top vial for dispensation of a predetermined dosage of a pharmaceutical preparation and a molded cap of resilient material mounted on and covering the top of the vial, the cap having an integral skirt, encompassing the upper portion of the vial, the inner surface of the skirt and the outer surface of the upper portion of the vial comprising complementary mating interlock elements precluding manual removal of the cap from the vial, the cap further comprising a tear member defined by at least one weakened junction line such that removal of the tear member permits ready removal of the cap from the vial;

the improved construction permitting filling of the vial after the cap has been mounted on the vial but precluding post-filling contamination or tampering, comprising:

a fill hole in the top of the cap affording access to the interior of the vial for filling the vial with the cap mounted on the vial;

and a stopper insertable in the fill hole to close and seal the fill hole after filling of the vial, the stopper having a configuration effectively precluding manual removal of the stopper from the fill hole after insertion therein.

4,420,093

MOLDED BUCKET AND LID HAVING HIGH STACK STRENGTH

John W. Von Holdt, 7430 N. Croname Rd., Niles, Ill. 60648

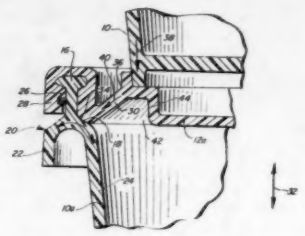
Continuation-in-part of Ser. No. 319,933, Nov. 10, 1981, and Ser. No. 329,258, Dec. 10, 1981, Pat. No. 4,380,305. This application Mar. 9, 1982, Ser. No. 356,496
Int. Cl.³ B65D *41/16, 41/18*
U.S. Cl. 220—306 **9 Claims**

3. A molded bucket, which comprises:

a bucket lip defining an enlarged, annular projection at the mouth of said bucket;

an inwardly positioned, annular self facing said mouth adjacent said lip;

an outwardly positioned annular flange joined to said bucket adjacent said annular shelf, to provide extra hoop strength to the area of said annular shelf, which carries a lid attached to said lip, said lid defining in one piece a peripheral, annular recess receiving said annular projection in



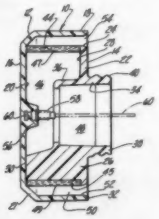
locking relation, and an annular, straight wall which extends radially inwardly from the vicinity of said recess at an angle of essentially 20° to 60° from the axis of said bucket, said annular straight wall being positioned with its outer edge adjacent said annular recess and abutting said annular shelf, and its inner edge extending outwardly toward said mouth relative to the outer edge, whereby said bucket and lid exhibit high stacking strength, an annular, upstanding flange is provided on the outer side of said lid at the inner edge of said annular recess.

4,426,094

VENT CAP

James P. Chapin, 1300 Arborview Blvd., Ann Arbor, Mich. 48103

Filed Jan. 21, 1982, Ser. No. 341,518
Int. Cl.³ B65D *51/16*
U.S. Cl. 220—37 **15 Claims**



1. A vent cap comprising:

a body having a top wall, a bottom wall and a closed side wall, said top, bottom and side walls defining an interior chamber,

a plurality of circumferentially spaced ribs extending and secured between the top and bottom walls,

a tubular member extending outwardly from the bottom wall, said tubular member having threads formed on its outwardly extending end and open at its other end to said chamber,

an annular filter entrapped between the top wall and bottom wall at a position spaced inwardly from said side wall so that one side of said filter is open to the interior chamber, said filter forming an annular subchamber between the air filter and the closed side wall, and

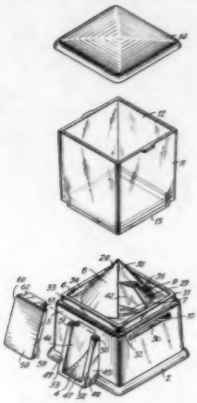
at least one opening formed through said bottom wall and open to said annular chamber.

4,420,095

MINIATURE GUM MACHINE

David Galoob, 90 Beachmont Dr., San Francisco, Calif. 94132

Filed Nov. 23, 1981, Ser. No. 324,068
Int. Cl.³ B65G *59/00*
U.S. Cl. 221—265 9 Claims



1. A miniature item machine, comprising

a base member having a bottom, a top spaced therefrom and a chute formed therein and extending from the top to the bottom thereof;

a base housing member fitted on said base member and having a top part spaced from the top of said base member, said top part having an opening formed therein partially extending over said chute and a dispenser housing of substantially conical configuration extending upward therefrom around part of said opening, said dispenser housing having an axis, a solid apex portion and a hollow base portion whereby said base portion next-adjacent the top of said base member is of substantially frusto-conical configuration;

a dispenser device rotatably mounted in the dispenser housing of said base housing member on the top of said base member and having an arm extending from said base housing member for selectively manually rotating said dispenser device;

a storage receptacle of substantially sleeve-like configuration having an open top and a spaced open bottom affixed to the top part of said base housing member for storing miniature items whereby a predetermined number of said items are selectively dispensed from said storage receptacle to said chute and thence out of said chute by manual rotation of said dispenser device; and

a cover removably mounted on the top of said storage receptacle for providing access to said receptacle.

4,420,096

CHILD-RESISTANT ACTUATOR COVER

Donald C. Kirk, Jr., Midlothian, Va., assignor to Ethyl Products Company, Richmond, Va.

Continuation-in-part of Ser. No. 826,276, Aug. 22, 1977, abandoned. This application Jun. 12, 1981, Ser. No. 273,003
Int. Cl.³ B65D *47/34*
U.S. Cl. 222—44 14 Claims

1. An actuator assembly for a dispensing device comprising, in combination:

a. a cap body piece having

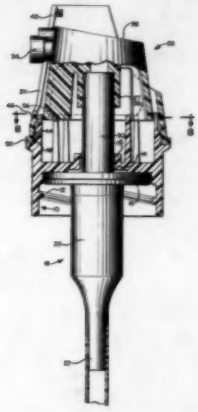
i. means for attachment to a container,

ii. an exterior peripheral surface for engagement by the fingers of the user to enable said cap body piece to be manually screwed onto said container neck,

iii. side walls connected by a flange having a hole therein for receipt of pump plunger means,

iv. two arcuate protuberances projecting upwardly from said flange inside said side walls to define a first slot and a second slot, said first slot being larger than said second slot;

b. a generally round, operable dispensing button and means mounting said button on said cap body piece for both rotation through 360 degrees and axial movement while



preventing tilting movement, said button having a downwardly extending skirt with a lower edge fitting closely within said sidewalls and having three tabs projecting radially inwardly from said skirt, two of said tabs being arranged close enough together to be received within said first slot and the remaining tab being arranged to be received in said second slot when said button is positioned in the dispensing mode permitting axial movement of said button;

c. a cover piece enclosing said button and adapted to expose a portion of the button for finger engagement; and,

d. a guide on said button and said cover piece for preventing relative turning therebetween while enabling relative axial movement to be had.

4,420,097

PORTABLE LIQUID DISPENSER WITH CARRYING CASE

Gregg A. Motsenbocker, 874 Felspar St., San Diego, Calif. 92109

Filed Jan. 15, 1981, Ser. No. 225,267
Int. Cl.³ B65D *33/06, 33/36, 35/14*
U.S. Cl. 222—131 17 Claims

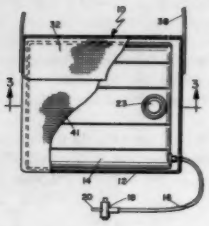
5. A liquid carrier and dispenser comprising:

a container for ingestible liquid comprising an envelope of flexible, collapsible, water impervious sheet material;

means for admitting ingestible liquid into the interior of said liquid container;

a sealed second container wholly housed within said liquid container, said second container having a non-toxic temperature retaining material therein to provide direct surface contact and heat transfer between the liquid and said second container, said liquid container being collapsible

closely around said second container for convenience in storage, transporting, freezing and heating; and



dispensing means for controlled dispensing of the liquid at a point remote from the liquid container.

4,420,098

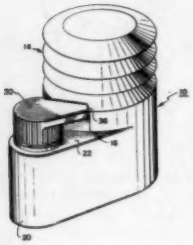
BELLOWS ACTUATED FOAM DISPENSER

Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425

Filed Nov. 10, 1981, Ser. No. 319,946

Int. Cl.³ F04C *1/14*; B65D *43/02*

U.S. Cl. 222—190 **5 Claims**



1. A foam dispenser comprising:

a hollow vertical cylinder having a top disposed horizontal first opening therein and a side disposed second opening therein which extends upward from the bottom of the cylinder to a position adjacent but below the first opening, said cylinder being otherwise sealed;

a hollow body integral with said cylinder, the interior of said body communicating via said second opening into the interior of the cylinder to form a common hollow chamber, said body extending outward from the cylinder and having a horizontal top, said top having a horizontal third opening therein, said body being otherwise sealed, said top having a raised elongated horizontal conduit extending between said second opening and said third opening to establish an air passage between said cylinder and said body when the chamber contains liquid to be dispensed and the level of the liquid in the chamber is coincident with said top;

first means including manually operable bellows secured and sealed to said first opening;

second means including a discharge orifice secured and sealed to said third opening;

a vertical dip tube open at both ends and disposed in said body, the top end of the tube being disposed adjacent said third opening, the bottom end of the tube being adjacent but spaced above the bottom of the body; and

third means disposed in said third opening above the liquid level, said third means being connected to the top end of the tube and coupled to the second means whereby when the bellows is compressed liquid forced upwardly out of the tube is mixed with air in the third means to produce foam which is discharged through the orifice, ambient air being drawn through said orifice into the chamber to replace the liquid expelled when the compression force on said bellows is released.

4,420,099

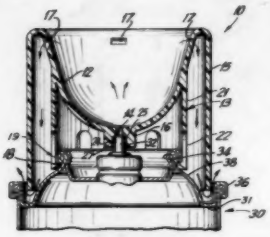
CUP-SHAPED ACTUATOR FOR AEROSOL DISPENSER

Joseph C. Pizzurro, Scarsdale, and Virgil Naku, Hawthorne, both of N.Y., assignors to Precision Valve Corporation, Yonkers, N.Y.

Filed Jun. 10, 1981, Ser. No. 272,122

Int. Cl.³ B67D *5/06*; G01F *11/20*

U.S. Cl. 222—205 **4 Claims**



1. In an actuator for a pressurized aerosol dispenser which comprises a one-piece actuator body having a generally cylindrical outer wall, a cup-shaped portion having an upper edge defining a cup-shaped receptacle open at the top, the facing surfaces of said cylindrical outer wall and cup-shaped member defining an inner space, a discharge orifice near the bottom of the cup-shaped receptacle, a socket on the underside of the discharge orifice adapted to receive the hollow valve stem of a pressurized aerosol container, said socket having an opening communicating at one end with the discharge orifice of the actuator and at the other end with the hollow valve stem, the improvement comprising at least one vent aperture disposed in the surface defining the cup-shaped receptacle, which vent is disposed beneath the upper edge of the actuator and provides a passage from the cup-shaped receptacle to the inner space for propellant gas to escape from the product, said actuator being further adapted to vent the gas from the inner space.

4,420,100

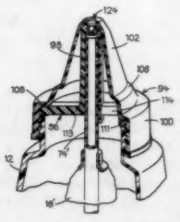
DISPENSING APPARATUS

John J. Mueller, Woodbury, Minn., assignor to Containaire, Inc., Cleveland, Ohio

Continuation of Ser. No. 956,096, Oct. 31, 1978, abandoned. This application Jan. 16, 1981, Ser. No. 225,718

Int. Cl.³ B65D *37/00*

U.S. Cl. 222—205 **14 Claims**



1. Dispensing apparatus for a flexible container, comprising:

a closure having first and second openings, said closure

constructed to be secured at the first opening to a flexible container to cover an opening of the container,

the second opening in the closure being a discharge passage through which contents of a container to which the closure is secured can be dispensed,

an expansible bladder adapted to be received in the container and to receive fluid to displace dispensed contents, thereby dividing the interior of the container into a contents-containing portion exteriorly of the bladder and a contents-displacing portion within the bladder,

check valve means to prevent flow through the second opening into the contents-containing portion of the dispenser while automatically allowing outflow from the contents-containing portion in response to greater fluid pressure inside the container than out,

a conduit extending from within the closure to the bladder, providing a passage to the bladder with an inlet that receives flow through one of said first and second openings from the exterior of the closure and an associated container, and

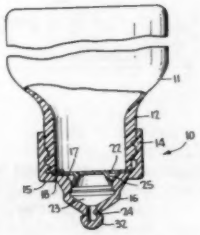
a check valve to allow flow through the conduit only into the bladder during use.

4,420,101

SQUEEZE BOTTLE WITH SELF-VENTING DISPENSING CLOSURE

Richard K. O'Neill, Pomona, Calif., assignor to Diamond International Corp., New York, N.Y.

Filed Nov. 18, 1981, Ser. No. 322,703
Int. Cl.³ B05B *11/04*
U.S. Cl. 222—212 **16 Claims**



1. A self-venting dispensing closure for fluid-tight engagement with a squeeze bottle, comprising a cap containing a fluid opening, a disc on said cap containing a fluid bore which defines together with said fluid opening a single fluid passageway through the closure, said cap including an annular wall having a first portion defining a valve seat lying upstream of said fluid opening in the direction of product flow through said passageway, said disc having an annular valve thereon in engagement with said valve seat in a first position for closing said fluid passageway, at least a portion of said disc adjacent said valve being flexible to permit shifting of said valve along said annular wall into second and third positions respectively upstream and downstream of said valve seat in response to subatmospheric and super-atmospheric pressures within the bottle, first and second means on said annular wall respectively lying upstream and downstream of said valve seat to permit said fluid passageway to open respectively into bottle venting and dispensing positions corresponding to said second and third positions of said valve.

4,420,102

AUTOMATIC CONTOURING NAPKIN RING

Lloyd D. Clark, 15 Conrad St., San Francisco, Calif. 94131

Filed May 15, 1981, Ser. No. 263,899
Int. Cl.³ A41H *33/00*
U.S. Cl. 223—34 **11 Claims**

1. A napkin-shaping ring comprising an annular-shaped external portion,

a cantilevered member extending from a part of an inside surface of said annular-shaped external portion toward the center of said annular-shaped external portion,

a portion of said cantilevered member remote from said part of said inside surface of said annular-shaped external portion being wider than the rest of said cantilevered member,

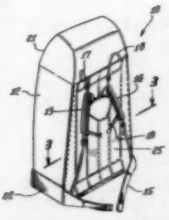
the internal height of said annular-shaped external portion, measured from said part of said inside surface thereof to the opposite inside surface thereof, approximating the internal width of said annular-shaped external portion, measured perpendicularly to said height measurment direction, such that when a cloth napkin is inserted, tip first, between the free end of said cantilevered member and said opposite inside surface of said anular-shaped external portion, and drawn about halfway into said ring, it will (a) be forced around between the inside surface of said annular-shaped external portion and said wider part of said cantilevered member to meet the opposite sides of the rest of said cantilevered member between said wider part thereof and said part of said inside surface of said annular-shaped external portion and (b) be forced to conform to the general shape defined by the internal structure of said napkin ring.

4,420,103

BACKPACK

Donald C. Douglass, Ventura, Calif., assignor to Wilderness Group Inc., Ventura, Calif.

Filed Sep. 7, 1982, Ser. No. 415,473
Int. Cl.³ A45F *3/04*
U.S. Cl. 224—210 **5 Claims**



1. A backpack with integral frame, including in combination:

a load carrying sack having a front face, a pair of shoulder straps and a waistband; and

a support pad mounted on said front face; said pad comprising

a foam sheet having a first height,

a stiffener sheet having a second height less than said first height, and

a protective sheet,

with said stiffener sheet, foam sheet and protective sheet attached to said front face by stitching,

with a plurality of vertical rows of stitching defining vertically disposed panels, and

a plurality of horizontal rows of stitching defining upper and lower sandwich structures of front face, foam sheet and protective sheet, and an intermediate sandwich structure of front face, stiffener sheet, foam sheet and protective sheet.

4,420,104

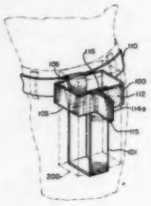
UNIVERSAL CARRYING CASE

Steven J. Dilenno, 6040 Lindbergh Blvd., Philadelphia, Pa. 19103

Filed Nov. 25, 1981, Ser. No. 324,644

Int. Cl.³ A45F *5/00*

U.S. Cl. 224—250 **14 Claims**



14. A method of making a carrying case comprising the steps of:

1. providing a tape like material having a fastening surface on one surface thereof;
2. providing a second tape like material having a complementary fastening surface thereon;
3. selecting a first length of said first tape like material and forming a loop at one end thereof;
4. securing a portion of said second, complementary material to the length of step 3 and the end opposite said loop and on the surface opposite said fastening surface;
5. selecting a second length of said first tape like material and securing a portion of said second, complementary material at one end thereof on the side opposite said first fastening surface;
6. inserting said second length through the loop of said first length.

4,420,105

FLEXIBLE HINGE AND CLOSURE MEMBER FOR A LUGGAGE CARRIER

John P. Nepper, 9826 Hartman, Omaha, Nebr. 68134

Filed Sep. 30, 1982, Ser. No. 431,712

Int. Cl.³ B60R *9/04*

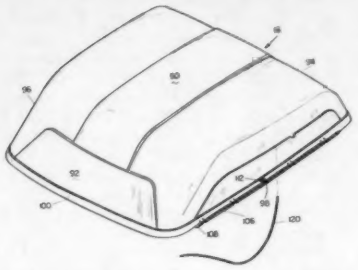
U.S. Cl. 224—328 **8 Claims**

1. A storage container for travel comprising,

a lower portion including a bottom, front and back walls, and opposite side walls, each of said walls having an upper end,

an upper portion removably mounted on said lower portion and including a top, front and back walls, and opposite side walls, each of said walls having a lower end,

and an elongated flexible member detachably hingedly securing the lower end of at least one of the walls of said



upper portion to the upper end of at least one of the walls of said lower portion.

4,420,106

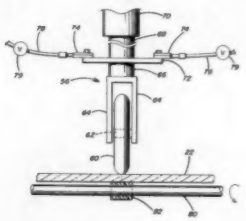
METHOD OF AND APPARATUS FOR DAMAGE-FREE SCORING OF REFRACTORY MATERIAL

Charles J. Hyatt, Cheswick, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 3, 1981, Ser. No. 289,590

Int. Cl.³ C03B *33/02;* B26D *3/08;* B26F *3/00*

U.S. Cl. 225—2 **13 Claims**



1. A method of imposing a damage-free score in a piece of refractory material, comprising the steps of:

biasing damage-free scoring means against the surface of said piece of refractory material with a biasing force sufficient to propogate a damage-free score therein but insufficient to initiate a damage-free score therein in the absence of an underlying surface defect;

imparting vibrations to said scoring means to oscillate said scoring means while practicing said biasing step to create a surface defect in said refractory piece capable of generating a damage-free score therein; and

moving said refractory piece and said scoring means relative to one another while practicing said biasing step to propogate said damage-free score within said piece of refractory material extending from the surface defect created by the imparting step.

4,420,107

LEAD FRAME ADVANCE SYSTEM

Michael Seyffert, Santa Cruz, and Alan F. d'Entremont, Sunol, both of Calif., assignors to National Semiconductor Corp., Santa Clara, Calif.

Filed Feb. 18, 1982, Ser. No. 349,954

Int. Cl.³ B65H *23/16, 25/02, 17/22*

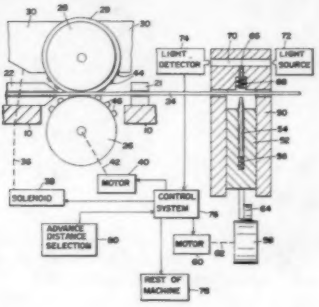
U.S. Cl. 226—32 **4 Claims**

1. A lead frame incremental advance system for moving a

continuous strip of lead frame along its length by a predetermined adjustable distance comprising in combination:

roller means adapted to frictionally contact said lead frame comprising first and second pinch rollers on both sides of the lead frame, said first pinch roller connected to be driven by said motor means and having gear teeth thereon, said second pinch roller also having gear teeth thereon positioned to engage the gear teeth on the first roller so as to be driven by said first roller;

engagement means operable to move said roller means into contact with said lead frame;



motor means connected to said roller means so as to turn said roller means and advance said lead frame when said roller means is in contact with said lead frame;

final alignment means adapted to cooperate with holes at known positions in said lead frame, after the lead frame is advanced by said roller means, so as to mechanically move the lead frame to the correct final position; and

control means connected to said motor means, said final alignment means and said engagement means so as to first cause said engagement means to move said roller means, secondly cause said motor means to turn said roller means and advance the lead frame a predetermined distance, and finally operate the final alignment means.

4,420,108

APPARATUS FOR THE CONTROLLED FEEDING AND TAKING-OFF OF A THREAD INTO AND OUT OF A THREAD TREATMENT SECTION

Jürgen Kallmann, Kaarst, Fed. Rep. of Germany, assignor to Palitex Project-Company GmbH, Krefeld, Fed. Rep. of Germany

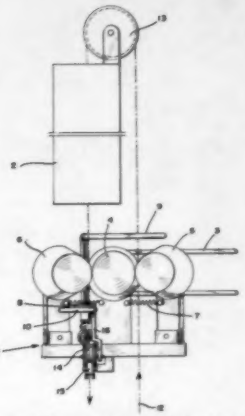
Filed May 22, 1981, Ser. No. 266,585

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023068

Int. Cl.³ B65H *51/08, 51/30*

U.S. Cl. 226—34 **14 Claims**

1. Apparatus for the controlled thread feeding into an incoming thread section and withdrawing of a thread from a thread outgoing section for passage into and out of a thread treatment section, said apparatus comprising; an externally drivable tapered surface drive roll and first and second tapered counter-pressure rolls bearing upon said tapered surface drive roll from opposite sides thereof defining with the latter a first gap or nip forming a feeding-in delivery means for said incoming thread section and a second gap or nip forming a take-off delivery means for said outgoing thread section, said thread travelling to said thread treatment section engaging between the drive roll and said first counter-pressure roll, said thread travelling away from said thread treatment section engaging between said drive roll and said second counter-pressure roll, and first and second movable thread guide members for moving said thread along said tapered surface of said drive roll in response to variations in thread tension.



4,420,109

FLUTTER COMPENSATED MAGNETIC TAPE TRANSDUCING DRIVE APPARATUS

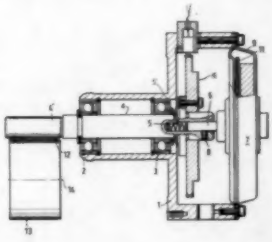
Heinrich Zahn, and Gerhard Falk, both of Rossdorf, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 18, 1981, Ser. No. 274,718

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1980, 3025132

Int. Cl.³ B65H *17/20*

U.S. Cl. 226—181 **2 Claims**



1. Flutter compensated magnetic tape transducing drive apparatus comprising

a drive system having a first mass rotating in a first direction, including a drive capstan (**4'**) positioned to drive a tape (**12**) and means to drive the capstan,

the tape having one side thereof in engagement with the circumference of the capstan; and

a counter or pressure roller (**13**) positioned to engage the other side of the tape (**12**) and press the tape against the circumference of the drive capstan (**4'**), said counter or pressure roller being in frictional engagement with the tape, and rotating in a direction of rotation opposite to the first direction

wherein the counter roller (**13**) has a mass which is matched to the mass of the drive system to form a counter-rotating mass to compensate for external rotary forces acting on the tape, and wherein the moment of inertia of the drive

system about the axis of rotation of the drive capstan (4') and the moment of inertia of the counter roller (13) about its axis of rotation are related by the equation:

$$\frac{J_1}{J_2} = \frac{r_1}{r_2}$$

wherein J_1 is the moment of inertia of the drive system about the axis of rotation of the drive capstan (4');

r_1 is the radius of the drive capstan (4');

J_2 is the moment of inertia of the counter or pressure roller (13) about its axis of rotation (149; and

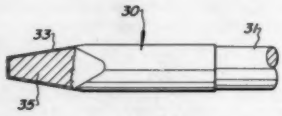
r_2 is the radius of the counter or pressure roller (13).

4,420,110

NON-WETTING ARTICLES AND METHOD FOR SOLDERING OPERATIONS

Allan W. McCullough, Irving, and Richard A. Springer, Euless, both of Tex., assignors to Materials Technology Corporation, Dallas, Tex.

Filed Oct. 5, 1981, Ser. No. 308,282
Int. Cl.³ B23K *3/00, 3/02*
U.S. Cl. 228—54 **12 Claims**



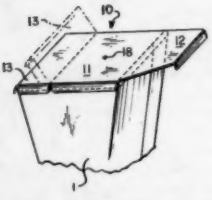
1. A method for preventing the coating of a metal article with a filler metal such as solder or braze metal, which article when exposed to said filler metal in a molten condition of said filler metal is normally wetted with a coating of said filler metal, said method comprising the steps of applying a layer of a titanium compound selected from a group which includes titanium carbide, titanium nitride and titanium diboride to the surface of said article prior to exposing said article to said filler metal.

4,420,111

CUP AND COVER COMBINATION

Erwin Hament, 53-22 Roosevelt Ave., Woodside, N.Y. 11377

Filed Jul. 27, 1982, Ser. No. 402,224
Int. Cl.³ B65D *41/26, 47/04*
U.S. Cl. 229—7 SC **12 Claims**



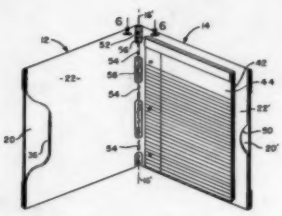
1. In combination: a drinking cup having walls forming a substantially rectangular open top mouth; and a cover for the cup comprising means for releasably retaining the cover on the mouth of the cup and for permitting sliding movement of the cover parallel to two parallel sides of the mouth and between first and second extreme positions, wherein the cover has means for completely closing the mouth of the cup when the cover is in the first position and opening means forming a pouring aperature at the mouth of the cup when the cover is in the second position, said opening means extending beyond said cup walls when said cover is in said first position.

4,420,112

PORTFOLIO CONSTRUCTION

Robert C. Cline, Washburn Terrace, Saugerties, N.Y. 12477

Continuation of Ser. No. 59,320, Jul. 20, 1979, abandoned. This application May 6, 1981, Ser. No. 260,592
Int. Cl.³ B65D *27/08*
U.S. Cl. 229—72 **10 Claims**



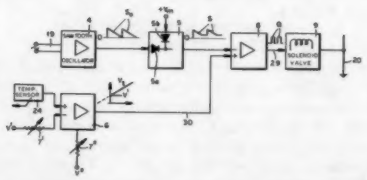
1. A portfolio of one-piece pliant sheet construction, comprising front and back covers having spaced upper, lower and side edges, the covers being hinge-connected on a fold axis extending vertically between said upper and lower edges; each cover comprising an outer panel and a middle panel and an inner panel, the outer panels being connected to each other along the fold axis of hinge connection; the middle panel of each cover being a first extension of the associated outer panel vertically beyond one of said upper and lower edges thereof and folded along said one edge to lie in confronting outer-pocket-defining relation with the associated outer panel; the inner panel of each cover being a second and opposite extension of the associated outer panel vertically beyond the other of said upper and lower edges thereof and folded along said other edge to lie in confronting inner-pocket-defining relation with the associated middle panel; securing means fastening said inner and middle panels to each other essentially on an alignment adjacent and parallel to said one edge; and said side edges being unfastened to define pockets for the insertion of material between said outer, middle and inner panels.

4,420,113

METHOD OF AND SYSTEM FOR CONTROLLING THE OPERATION OF A HEATER

Alain Lacroix, Lyons, France, assignor to Societe Lyonnaise des Applications Catalytiques, Rillieux-la-Pape, France

Filed May 28, 1982, Ser. No. 383,125
Claims priority, application France, May 29, 1981, 81 11018
Int. Cl.³ G05D *23/00;* **H05B** *1/02*
U.S. Cl. 236—1 EB **11 Claims**



1. A method of operating a heater, comprising the steps of:

(a) continuously sensing the temperature of a location in the environment of the heater;

(b) operating the heater at full power as long as said temperature lies beneath a lower limit of a predetermined range;

(c) upon a rise of said temperature above said lower limit,

varying the mean power of said heater generally inversely with temperature changes within said range;

(d) cutting off the heater upon said temperature exceeding a predetermined upper limit of said range; and

(e) restarting the operation of said heater only upon said temperature dropping again beneath said lower limit.

4,420,114

LIQUID HEATING SYSTEM

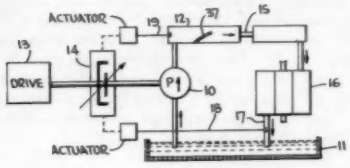
Gottfried Moser, Gladbach; Walter Nau, Cologne, and Ernst D. Neumann, Aachen, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Apr. 1, 1981, Ser. No. 249,936

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012760

Int. Cl.³ F24C *9/00*

U.S. Cl. 237—1 R **21 Claims**



1. A liquid heating system, comprising a high-pressure hydraulic pump for suctioning the liquid from a liquid reservoir and delivering it thereto through a liquid conduit into which said pump is coupled, a variable speed internal combustion engine of a motor vehicle or an operating apparatus provided for driving said pump, a pressure-reducing element comprising a non-adjustable restrictor coupled into said conduit downstream of said pump for reducing the pressure and elevating the temperature of the liquid, said element having a fixed flow passage, a heat exchanger coupled into said conduit downstream of said element, and means for controlling the discharge rate of flow of said pump as a function of the calorific heat required to be generated by the system and/or of the temperature of the liquid, said control means including means for adjusting said pump for maintaining a predetermined discharge rate of flow thereof upstream of said pressure-reducing element even at low idling speeds of said engine, said adjusting means comprising a transmission assembly between said engine and said pump, said transmission assembly being inversely coupled to said engine so as to effect a decreasing transmission ratio as engine speed increases.

4,420,115

AUTOMOTIVE AIR CONDITIONER

Katsuaki Matsushima, and Goro Uchida, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 24, 1981, Ser. No. 324,413

Claims priority, application Japan, Apr. 17, 1981, 56-55345[U]

Int. Cl.³ B60H *1/02*

U.S. Cl. 237—12.3 A **2 Claims**

1. An air mixing control type air conditioner comprising:

a heater core within the air conditioner body having right and left air diffusing ports,

an air passage divided by a partition plate into right and left side passages to the air diffusing ports of said heater core,

a main air mixing damper at said one side passage for controlling the air temperature of said one side passage,

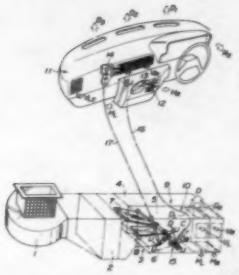
a sub air mixing damper at said the other side passage for controlling the air temperature of said other side passage,

a main temperature control lever at said main air mixing damper for controlling the diffusing air temperature of said entire air conditioner,

a sub temperature control lever at said sub air mixing damper for controlling the diffusing air temperature of said one side passage; and

a link mechanism at said heater core, and said main and sub temperature control levers are coupled to said link mechanism, said link mechanism comprising:

a main lever rotatably coupled to said main temperature control lever and also to a main shaft in such a manner that said main lever is rotatable around said main shaft, on which said one side damper is rotatably mounted in a range between a fully opened position and a fully closed position,



a coupling lever rotatably coupled to said sub temperature control lever and engaged with a sub mounting shaft in such a manner that said coupling lever is rotatable around said sub mounting shaft,

a link connected to said coupling lever at one end and also connected to a pin at the other end, which pin is slidably inserted into a long hole at said main lever in such a manner that said pin is able to be fixed by pressing within the hole of said main lever at any position and is rotatably engaged with one end of a rod, and

a hollow sub shaft connected to said sub air mixing damper and to which said main shaft is inserted in the hollow cavity thereof in such a manner that said sub shaft is rotatable coaxially with the axis of said main shaft and said sub lever is fixed to one end of said sub shaft.

4,420,116

UNIT INJECTOR EMPLOYING HYDRAULICALLY CONTROLLED TIMING AND FUEL SHUT OFF

Timothy A. Warlick, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 31, 1981, Ser. No. 336,308

Int. Cl.³ F02M *45/00, 53/04, 55/00*

U.S. Cl. 239—95 **17 Claims**

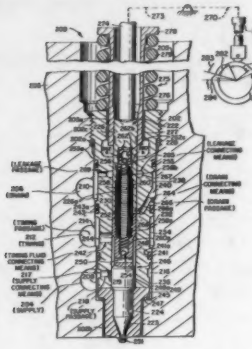
1. A fluid injector, comprising

(a) an injector body containing a central bore and an injection orifice communicating with said central bore;

(b) an injector plunger mounted for periodic reciprocal movement within said central bore between an innermost position in which said injection orifice is closed and an outermost position in which an injection chamber is formed within said central bore between the inner end of said injector plunger and said injection orifice, said injector plunger including an inner plunger section and an outer plunger section mounted for independent reciprocal movement within said central bore to define a variable volume timing chamber between said plunger sections;

(c) supply connecting means for providing a pathway for fluid under pressure to flow from a source into said injection chamber;

(d) timing fluid connecting means for providing a pathway for fluid under pressure to flow from a timing fluid source into said timing chamber; and



(e) biasing means for biasing said first and second plunger sections together with a force which is a stepped function of the axial distance between said plunger sections.

4,420,117

WASTE PAPER DISINTEGRATING, SORTING AND FIBER RECOVERY APPARATUS

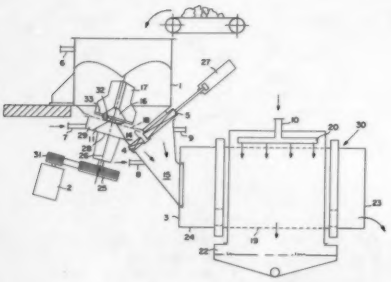
Fritz Peroutka; Helmut Thumm; Theodor Bähr, all of Heidenheim, and Walter Stricker, Aalen, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Jul. 7, 1981, Ser. No. 281,075

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026136

Int. Cl.³ B02C *19/00*

U.S. Cl. 241—46.17 **19 Claims**



1. Apparatus for disintegrating waste paper and for sorting fibers from the fiber suspension for recovery, comprising:

a paper disintegrator, comprising: a disintegrating chamber including a container for having waste paper disintegrated therein; the disintegrating chamber having a bottom;

means for applying a suspension of waste paper having a pulp density of about 10–20% to said container;

a circulating member located near the bottom of the disintegrating chamber and being rotatable in the chamber about a respective rotation axis of the circulating member; the circulating member axis being inclined at an acute angle to the vertical;

a suspension discharge chamber disposed beneath the bottom of the disintegrating chamber; a first suspension discharge line extending from a lower region of the discharge chamber for discharge of suspension from said discharge chamber through the first suspension discharge line; a dilution water line being connected to the discharge chamber for diluting said suspension of waste paper located in said discharge chamber to a lower density than that in said disintegrating chamber;

a screen located between the circulating member and the discharge chamber and also defining a screen barrier between the disintegrating chamber and the discharge chamber, the screen preventing particles above a first predetermined size from passing into the discharge chamber from the disintegrating chamber; the screen being inclined from the horizontal by approximately the same angle as the circulating member axis is inclined from the vertical;

the circulating member having a lower side which is oriented generally parallel to the screen;

a second suspension discharge line communicating from the region in the disintegrating chamber above the screen for discharge of suspension through the second suspension discharge line;

a sorting device communicating with the first and second suspension discharge lines; the sorting device having a screen mesh therein for passing particles smaller than a second predetermined size therethrough; said sorting device including a discharge opening which permits that portion of the suspension applied to said sorting device which does not pass through said screen mesh to continually exit said sorting device.

4,420,118

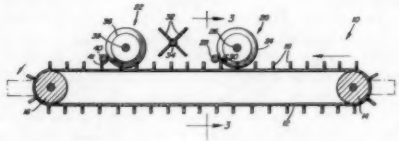
CAULIFLOWER SIZE CUTTER

Gary N. Gehlen, Stayton, Oreg., assignor to Stayton Canning Company Cooperative, Stayton, Oreg.

Filed Jul. 14, 1981, Ser. No. 285,371

Int. Cl.³ B02C *19/00*

U.S. Cl. 241—101.2 **2 Claims**



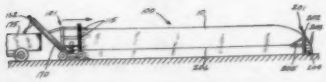
1. A machine for cutting large vegetables such as cauliflower into smaller pieces comprising a conveyor belt having a plurality of transversely extending cleats projecting perpendicularly therefrom to form a plurality of transversely extending pockets, means supporting said conveyor belt with an elongated portion disposed horizontally whereby vegetables may be gravity fed into the pockets, a first cutting station overlying the belt, a second cutting station overlying the belt in longitudinally spaced relation to said first cutting station, each of said cutting stations including a plurality of spaced circular knives having a sharp peripheral edge disposed adjacent the upper surface of the belt, a shaft journaling said knives, a stripper bar paralleling the shaft on the downstream side of each cutting station, and a plurality of fingers on the stripper bar inserted between the knives to strip material therefrom, each of said cleats including slot-like notches therein through which the periphery of the knives can pass thereby permitting the knives to cut the vegetables in the pockets without cutting the cleats, a transversely extending shaft mounted for rotation and disposed above and parallel to the conveyor belt between the cutting stations, a plurality of radial paddles on said transversely extending shaft to engage any vegetable pieces above the cleats and move them into the pockets for cutting by the knives in the second cutting station, said stripper bars and fingers being located adjacent the upper edge of the cleats with the fingers generally horizontally disposed.

4,420,119

HORIZONTAL SILAGE UNLOADER

Vernon V. Johnson, P.O. Box 65, Glava, Iowa 51020

Filed Oct. 2, 1981, Ser. No. 308,239
Int. Cl.³ B02C *13/286*
U.S. Cl. 241—101.7 **7 Claims**



1. A horizontal silage unloader for use with an elongated plastic bag containing silage, comprising:

an unloading mechanism which includes a wheeled framework which supports a plurality of driven rotary beater elements;

a bed associated with the wheeled framework which accomodates a plurality of driven conveyor means;

travel means associated with said unloader mechanism to move said unloader mechanism from one end of the plastic silage bag to the other end of the plastic silage bag;

a plurality of driven plastic gathering rollers rotatably supported upon said wheeled framework;

a plurality of cutter blades mounted on said wheeled framework and adapted to sever the plastic bag into sections as said wheeled framework moves from one end of the plastic silage bag to the other; and

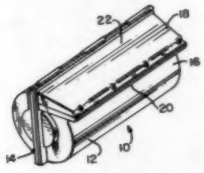
means associated with said driven plastic gathering rollers to attach the ends of said plastic sections to the gathering rollers to accumulate the cut plastic sections as the unloader mechanism moves from one end of the bag to the other.

4,420,120

CASSETTE, FOR SHEET PHOTOGRAPHIC MATERIALS

Gary E. Raymond, 755 S. Rainbow Dr., Hollywood, Fla. 33021

Filed Jun. 14, 1982, Ser. No. 387,865
Int. Cl.³ G03B *1/04*
U.S. Cl. 242—71.7 **15 Claims**



1. A cassette, for sheet photographic materials, such as negative stock, emulsified paper, and the like, comprising:

: housing having an elongate central axis;

said housing having means defining a substantially cylindrical chamber therewithin;

said means comprising a peripheral wall circumscribing said axis on a given radius and extending through not less than two hundred and seventy degrees of arc;

said housing further having an opening formed therein along a plane which is substantially tangential to said peripheral wall; and wherein

said opening subsists at a distance from said axis which is greater than said given radius;

said housing further has means defining a walled trough extending parallel with said axis;

said trough has a pair of axially-extending surfaces which are in mutual alignment and in near contacting engagement;

said opening subsists between said surfaces;

at least one of said surfaces is disposed in a given plane and has a second trough surface immediately adjoining disposed at an angle from said given plane; and

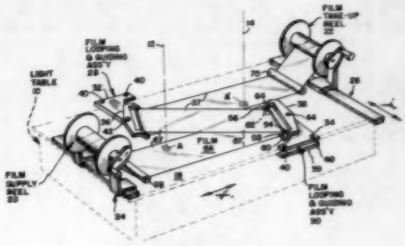
said angle of said second trough surface is approximately twenty degrees of arc from said given plane.

4,420,121

ROLL FILM LOOPING AND GUIDING APPARATUS

Alfred L. Shawcross, Lima; Frederick J. Ramsey, and Arnold A. Raymond, both of Rochester, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Sep. 3, 1981, Ser. No. 298,971
Int. Cl.³ G03B *1/04*; B65H *27/00*
U.S. Cl. 242—181 **10 Claims**



1. Apparatus for supporting and accumulating roll film, comprising:

(a) means for supporting roll film for viewing thereof; and

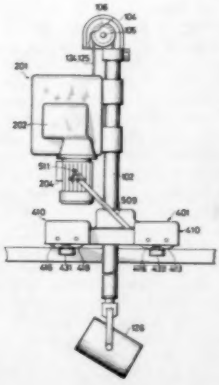
(b) first and second assemblies pivotally mounted to said film supporting means, said assemblies including means for looping and guiding roll film through two consecutive 180 degree arcs, said assemblies being offset from each other at least a distance equal to the width of roll film being viewed.

4,420,122

LIGHTING DEVICE SUSPENDING SYSTEM

Karl E. Maslo, Haufstrasse 7, D-8000 Muenchen 7, Fed. Rep. of Germany, and Suzuki Hiroyuki, 508, Yono-shi, Saitama, Japan

Filed Nov. 2, 1981, Ser. No. 317,233
Int. Cl.³ B66D *3/24, 3/20*; B65H *75/00*
U.S. Cl. 242—54 R **1 Claim**



1. A telescopically extendable hanging mechanism for suspending a lighting device, having a driving mechanism provided with wires for controlling extension of said hanging

mechanism, wherein the improvement comprises a wire take-up means for winding up or unwinding the wires adapted for telescopically extending out or contracting the hanging mechanism, said wire take-up means being given a rotative force and consisting of three discs of which the outermost disc has a recess at its outer edge; a ratchet wheel provided in said wire take-up means; a sensor lever provided swingably above said wire take-up means and always pressed in the direction of said take-up means, said sensor lever being provided with pawls so arranged that they are engaged with the ratchet wheel when said sensor lever is swung toward said take-up means; a pulley rotatably mounted at an end of said sensor lever and adapted to receive the wires used for telescopically extending out or contracting said hanging mechanism; a limit switch designed to detect any swinging motion of said sensor lever in the direction away from said take-up means to cut off the rotative force; a slider provided slidably on a diametrical portion of the outermost disc of said take-up means, said slider having its one end projected into said take-up means while the other end terminates in a sector portion positioned in the recess of said take-up means; and an unwinding sensor lever provided swingably below said take-up means and always pressed in the direction of said take-up means, said unwinding sensor lever having provided on its underside a roll contacting an outer edge of said take-up means and also provided with a pawl so arranged that it is engaged with the ratchet wheel when said roll is fitted in the recess at the outer edge of said take-up means.

4,420,123

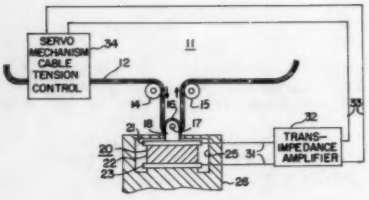
FORCE RATE SENSOR ASSEMBLY

David S. Fox, and Donald G. Cawelti, both of Tucson, Ariz., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 19, 1981, Ser. No. 312,202

Int. Cl.³ B65H *59/10*

U.S. Cl. 242—147 R **1 Claim**



1. A mechanism to control tension in a fiber optic cable during winding of the cable onto bobbins comprising:

at least two idler pulleys and a tension sensing pulley through which the cable is carried, whereby tension is applied to the tension pulley by the cable;

means connected to said tension pulley for measuring tension in said tension pulley comprising a plate of electrically non-conductive material carrying said tension pulley and which experiences a pull which is proportional to the tension in the cable, a piezoelectric transducer having crystal means bonded to upper and lower electrically conductive plates, said upper electrically conductive plate fixedly mounting said electrically non-conductive plate, a fixed frame of electrically non-conductive material bonded to said lower electrically conductive plate, and output leads connected to each of said electrically conductive plates for generating an electrical signal proportional to the force straining on said crystal means applied by said tension pulley and cable; the crystal means, plates and frame being configured to minimize the sensitivity of the crystal means to vibrations;

means for enhancing said electrical signal comprising a transimpedance operational amplifier means with inverse feedback, the input to which comprises a current from said electrical signal and the output of which comprises a voltage proportional to said input current, representing over time, the rate of change of the instantaneous applied force to the crystal means; and

a servo mechanism cable tension control means for varying tension, within selected limits, on the cable being wound, said servo mechanism cable tension control being actuated by a signal comprised of the output signal of said means for enhancing.

4,420,124

CARPET ROLLING MACHINE

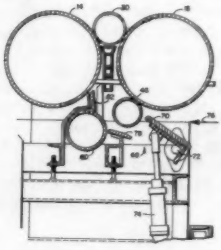
Harold B. Bardsley, Chorley; Brian J. Mosby, Blackpool; John M. Barlow, Chorley, and Brian Walton, Blackburn, all of England, assignors to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Aug. 30, 1982, Ser. No. 412,600

Claims priority, application United Kingdom, Nov. 5, 1981, 8133357

Int. Cl.³ B65H *17/12*

U.S. Cl. 242—66 **10 Claims**



1. A carpet rolling machine comprising a pair of rotatably drivable roll supporting rollers disposed to define a supporting nip on which a roll of carpet can be formed, a lower deflector disposed between the rollers, means for mounting said lower deflector for movement into sliding contact with each of the rollers selectively, said lower deflector having an upwardly facing cam surface, an upper deflector selectively movable from a rest position to an operative position disposed above the lower deflector, said upper deflector having a downwardly facing cam surface, said cam surfaces of said upper and lower deflectors and the periphery of the adjacent rollers together defining a generally cylindrical space to which an end of a piece of carpet can be fed and constrained to follow a cylindrical path when said upper deflector is in said operative position, means for moving said lower deflector into contact with a selected first of the rollers, means for rotating said first roller in a direction such that the surface of said first roller in contact with the lower deflector moves downwardly, means rotating the second roller in a direction relative to said first roller such that the surface of said second roller adjacent to said first roller moves upwardly, and means for feeding and directing the end of said piece of carpet upwardly against the upwardly moving surface of said second roller to feed said carpet into said cylindrical space to form an incipient carpet roll.

4,420,125

COLLAPSIBLE REEL

Manuel Martinez, New Providence, and Ronald P. Zelins, Rockaway, both of N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

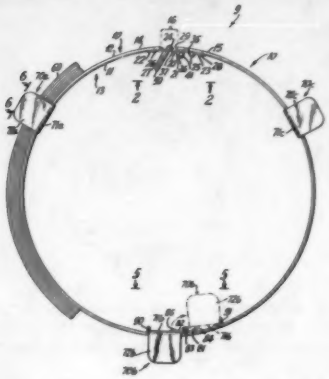
Filed Aug. 6, 1981, Ser. No. 290,280

Int. Cl.³ B65H *75/02, 75/24*

U.S. Cl. 242—77 **8 Claims**

7. A reel according to claim 6 in which said fastening means

comprises hinge means connecting said base to the inside of said band, and in which said means for holding said unit com-



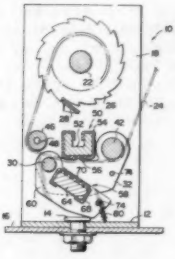
prises a resilient latch finger mounted on the inside of said band and adapted to make a detent engagement with said base.

4,420,126

WEBBING LOCK DEVICE

Takayuki Ando, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, both of Aichi, Japan

Filed Feb. 23, 1982, Ser. No. 351,369
Claims priority, application Japan, Mar. 3, 1981, 56-29245[U]
Int. Cl.³ A62B *35/02;* B65H *75/48, 59/16*
U.S. Cl. 242—107.2 **8 Claims**



1. A webbing lock device provided in a webbing retractor capable of winding and unwinding a webbing, comprising:

a stationary clamp member opposed and adjacent to one surface of the webbing;

a movable clamp member opposed to the outer surface of the webbing and having freedom of movement towards and away from said stationary clamp member;

a biasing means for biasing said movable clamp member away from said stationary clamp member;

a roller on which the webbing is wound;

a roller support member which rotatably supports said roller;

a deformable member rotatably supported by said roller support member and connected with said roller, whereby said roller is supported by said roller support member through said deformable member, said deformable member designed to deform to displace said roller so as to abut said roller against a portion of said roller support member when tension of the webbing reaches a predetermined value; and

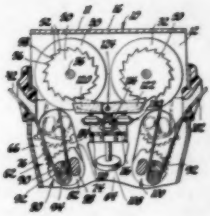
a connecting member connecting said roller support member with said movable clamp member, said connecting member being designed to break and release said roller support member from said movable support member when the tension of said webbing reaches a value higher than said predetermined value.

4,420,127

PAWL ACTUATOR FOR DUAL REEL RETRACTOR

Joseph D. Kondziola, Troy, and Donald C. Sobieski, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 4, 1981, Ser. No. 299,406
Int. Cl.³ A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 A **1 Claim**



1. A dual reel seat belt retractor comprising:

a housing;

first and second belt reels journaled on the housing for belt winding and unwinding rotation about parallel axes;

first and second ratchet wheels carried respectively by the first and second reels and having circumferentially spaced ratchet teeth;

first and second pawls mounted on the housing for movement between ratchet teeth engaging and disengaging positions respectively with the first and second ratchet wheels;

a transfer link having a longitudinal axis, first and second abutment portions spaced each side of the longitudinal axis of the transfer link and engaging respectively with the first and second pawls, a central portion, and a mounting end having a pair of trunnion pins projecting laterally of the mounting end and an axial pin projecting axially of the mounting end;

first and second mounting cradles carried by the housing and receiving the trunnion pins to restrain the transfer link against bodily movement along its axis but permit rolling movement of the transfer link about the axis and pivoting movement about the trunnion pins;

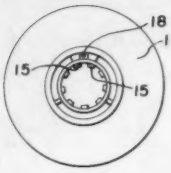
an apertured mounting tab carried by the housing and interfitting with the axial pin of the transfer link to restrain the upward movement of the mounting end in the upward direction toward the reels; and

an inertia sensor mounted on the housing and engaging the central portion of the transfer link whereby upon occurrence of predetermined inertia stimulus the transfer link is pivoted upwardly about the mounting end to simultaneously engage the first and second pawls with the ratchet teeth when the first and second ratchet wheels are in phase with one another and permitting the transfer link to roll simultaneous with pivoting movement to engage the first pawl with the first ratchet wheel irrespective of tip-on-tip locking engagement of the second pawl by the second ratchet wheel and then permit subsequent counter rolling movement of the transfer link by the inertia sensor to engage the second pawl with the second ratchet plate as permitted by slight unwinding rotation of the second reel to align the second ratchet wheel tooth for locking engagement by the second pawl.

4,420,128
MAGNETIC TAPE CASSETTE

Masatoshi Okamura, and Haruo Shiba, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1981, Ser. No. 323,536
Claims priority, application Japan, Feb. 12, 1981, 56-19036[U]
Int. Cl.³ G03B *1/04;* G11B *15/32*
U.S. Cl. 242—199 **2 Claims**



1. A magnetic tape cassette, comprising:

a casing;

a tape feeding reel in said casing, said tape feeding reel including a first reel hub having first annular winding core including a first recessed portion for insertion of a first fitting element, said first winding core including a circumferentially spaced plurality of driving ribs mounted thereon, said tape feeding reel further including a first through hole in said first reel hub at a position corresponding to said first recessed portion;

a tape winding reel in said casing, said tape winding reel including a second reel hub having a second annular winding core including a second recessed portion for insertion of a second fitting element, said second winding core including a circumferentially spaced plurality of driving ribs mounted thereon, said tape winding reel further including a second through hole in said second reel hub at a position corresponding to said second recessed portion; and

a tape wound between said reels and clamped thereto at said recessed portions by said fitting elements,

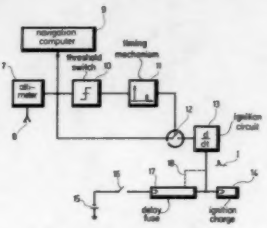
wherein one of said first and second through holes is mounted at a circumferential angular position corresponding to one of said driving ribs on a respective one of said first and second winding cores, and wherein the other of said first and second through holes is mounted at a circumferential angular position corresponding to a circumferential space between two of said driving ribs on a respective other of said first and second winding cores, whereby said tape feeding reel and said tape winding reel can be distinguished from one another.

4,420,129
GUIDED MISSILE AND FUZE SYSTEM THEREFOR

Günter Stetter, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm-Gesellschaft mit Beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Mar. 25, 1976, Ser. No. 670,910
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2514136
Int. Cl.³ F41G *7/22*
U.S. Cl. 244—3.15 **6 Claims**

1. For a guided missile having an impact fuze with a delay arrangement and an ignition charge and having an altitude measuring device as part of a trajectory control which measures the altitude and guides the missile toward a target from a first altitude through a lower transitional altitude and into a constant altitude as it approaches a target ship, an auxiliary fuze arrangement comprising a timing device, an enabling switch, an ignition circuit, said timing device being coupled to said altitude measuring device and responding to the missile reaching the transitional altitude and being coupled to the enabling switch for enabling the switch a predetermined time after the transitional altitude is reached, said ignition circuit being connected to one of said delay arrangement and said ignition charge for initiating ignition of the ignition charge,



said enabling switch connecting the altitude measuring device to said ignition circuit when the enabling switch is enabled so that said ignition circuit responds to altitude measurements indicative of a target ship.

4,420,130
FABRICATION PROCESS FOR AN ENVELOPE, IN PARTICULAR FOR SPACE BALLOONS, ENVELOPE THUS MADE, AND ITS APPLICATION TO THE AEROSPACE DOMAIN

Robert Regipa, Toulouse, France, assignor to Centre National d'Etudes Spatiales, Paris, France

Filed Dec. 22, 1980, Ser. No. 218,749
Claims priority, application France, Jan. 4, 1980, 80 00343
Int. Cl.³ B64B *1/40*
U.S. Cl. 244—31 **19 Claims**

1. A stress controlled mechanism for a space balloon having a longitudinal axis, comprising:

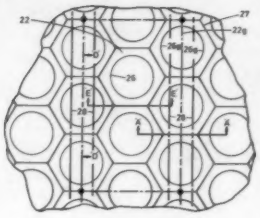
a. an axial tie means extending from the upper pole of a space balloon envelope, wherein said tie means passes through said space balloon envelope interior and through an aperture located in a slideable member fixedly attached to the lower pole of said space balloon envelope; and,

b. an adjustable stopping member positionable at a pre-selected point along said axial tie means in said space balloon interior as a means for stopping said slideable member and permitting said space balloon to assume a pre-selected shape upon inflation of said balloon.

4,420,131
MOORING DEVICES

Martin J. Middleton, Ilminster, England, assignor to Westland Aircraft Limited, Yeovil, England

Filed Nov. 3, 1981, Ser. No. 317,785
Claims priority, application United Kingdom, Nov. 25, 1980, 8037807
Int. Cl.³ B64F *1/12, 3/00*
U.S. Cl. 244—115 **12 Claims**

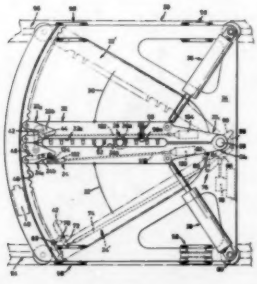


1. A mooring device for attachment to a surface comprises a grid having an upper surface adapted for engagement by a harpoon carried by an aircraft such as a helicopter, wherein the grid comprises a plurality of substantially identical elements, said elements being rectangular in plan, disposed in parallel rows, and having a central region of the upper surface of each element formed with a plurality of apertures of a desired shape and an edge region of each element formed with a plurality of half apertures arranged so that when the elements are positioned in a juxtaposed relationship the half apertures of adjacent elements combine to form apertures corresponding to the shape of the central apertures, and retaining means adapted to retain said elements in juxtaposed relationship on the surface.

4,420,132
SECURING DEVICE FOR HELICOPTERS AND THE LIKE

Gerald J. Martin, 49 Thorncliffe Park Dr., Apt. 908, Toronto, Ontario, Canada (M4H 1J6)

Filed Jun. 12, 1981, Ser. No. 273,153
Int. Cl.³ B64F *1/22*
U.S. Cl. 244—115 **10 Claims**



1. A device for securing helicopters and the like with respect to a support surface, the device comprising:

a pair of arresting beams which have first and second ends and which are adapted to co-operate to trap therebetween a probe depending form a helicopter and the like;

means pivotally supporting said beams adjacent their said first ends for movement about a common pivot axis between spaced apart positions in which the beams define therebetween a target area having the general shape of a sector of a circle for receiving a said probe, and positions in which the beams have moved inwardly into co-operating positions for trapping said probe, said pivotal supporting means being adapted to be mounted to said surface so that the helicopter and the like is secured with respect to said surface when the probe is trapped by said beams;

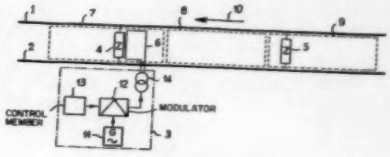
fluid pressure operated actuating means coupled to said beams and operable to move the beams between said spaced apart positions and said co-operating positions, said actuating means being adapted to cause the beams to trap a said probe anywhere within said target area; and,

means adapted to lock the beams both with respect to one another and angularly about said pivot axis after the beams have moved to their co-operating position and trapped a said probe.

4,420,133
DEVICE FOR THE TRANSMISSION OF INFORMATION THROUGH THE RAILS BETWEEN A RAILWAY TRACK AND A GROUP OF VEHICLES RUNNING ALONG THIS TRACK

Michel J. Dietrich, Le Plessis Belleville, France, assignor to Jeumont-Schneider, Puteaux, France

PCT No. PCT/FR79/00057, § 371 Date Mar. 17, 1980, § 102(e) Date Mar. 17, 1980, PCT Pub. No. WO80/00239, PCT Pub. Date Feb. 21, 1980
PCT Filed Jul. 2, 1979, Ser. No. 193,272
Claims priority, application France, Jul. 17, 1978, 78 21168
Int. Cl.³ B61L *3/00, 21/00*
U.S. Cl. 246—167 R **12 Claims**



1. A system for transmission of data along the rails of a railway track through a plurality of successive, contiguous zones, said data transmitted to a train passing along said track in a given direction of travel, said system comprising:

(1) a plurality of resonance circuits, each connected across the rails of said zone, pairs of said resonance circuits defining said zones therebetween, and said zones being independent of a block system of said railway track,

(2) an alternating current generator for each zone having a predetermined frequency outside frequency bands of said block system, said predetermined frequency producing a carrier frequency for the data to be transmitted.

(3) for each given zone, said pairs of said resonance circuits defining the given zone tuned to the carrier frequency of said generator within said given zone,

(4) means for modulating said carrier frequency for each zone corresponding to the data to be transmitted thereby providing a data signal for each zone,

(5) a plurality of insulated conductive windings in the form of conductive loops, one of said windings within each zone and positioned between the rails of said tracks adjacent the downstream side of each zone with respect to the direction of train travel, for each given zone said one winding positioned immediately proximate one of said pairs of resonance circuits of said given zone and remote from the other of said pair of resonance circuits of said given zone,

(6) means for coupling the winding within each zone to receive the data signal from the modulating means of each zone, and

(7) a receiver mounted onboard said train at a position near the forward end of said train along the direction of travel

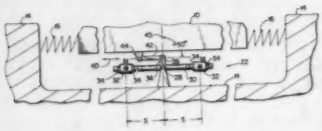
of said train, said receiver tuned to the respective carrier frequencies of each zone for receiving the data signals of each zone.

4,420,134

VIBRATION ISOLATOR WITH CRANK DRIVEN INERTIA BAR

William G. Flannelly, South Windsor, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Oct. 27, 1980, Ser. No. 201,186
Int. Cl.³ F16F *15/00*
U.S. Cl. 248—559 11 Claims



1. A vibration isolator for use with two bodies movable relative to one another with elastic restraint along a given line of action, said isolator comprising an elongated inertia bar connected intermediate its ends to one of said bodies for pivotal movement relative to said one body about a first pivot axis, a crank arm fixed relative to said inertia bar and connected to the other of said two bodies at a point spaced from said first axis, said point at which said crank arm is connected to said other body being located approximately in a plane containing said first pivot axis and generally perpendicular to said line of action so that relative movement between said two bodies along said line of action causes rotation of said inertia bar about said first pivot axis, said inertia bar being arranged with its longitudinal axis at an angle to said plane, and said inertia bar having a center of gravity located substantially on said first pivot axis.

4,420,135

SUPPORT PLATE

Erich Munz, Weststrasse 1, 5204 Lohmar 1 - Geber, Fed. Rep. of Germany

Filed Dec. 4, 1980, Ser. No. 212,909
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1979, 2949295
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—633 3 Claims

1. A vibration- and sound-absorbing support for mounting a machine on a base, the support comprising

(a) a load distributing and shape-retaining metal carrier having a top side for supporting the machine and a bottom side facing the base, and

(b) at least one pad of a vibration- and sound-absorbing material laminated to the bottom side of the metal carrier and disposed between the bottom side and the base, the pad comprising

(1) circumferential webs and intersecting webs between the circumferential webs, the webs contacting the base and defining a plurality of separate open chambers facing the base, and

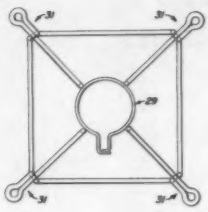
(2) a plurality of protuberances in each one of the chambers, the protuberances projecting from the pad towards the base and having a height lower than that of the webs.

4,420,136

MOUNTING ASSEMBLY

Donald W. Lau, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 8, 1981, Ser. No. 271,485
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—674 2 Claims



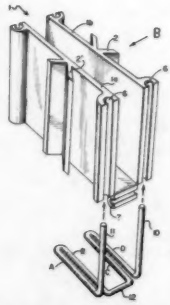
1. In a mounting assembly for mounting a motor such as an electric fan motor to a support means, said mounting assembly including a clamp fixably mounted to and extending around said motor's housing, a plurality of first mount arms, each being generally linear and rod-like fixably mounted at one end to said clamp in generally equal spaced apart relationship completely around said clamp and each of said arms having a loop portion at the other end fixably mounted to said support means, wherein the improvement comprises a plurality of second arms each fixably mounted at its respective ends to adjacent first mounting arms in close proximity to said respective loop, said second members in combination having generally an endless extension and generally forming individually a base portion of a triangle in combination with adjacent first members.

4,420,137

ADJUSTABLE FOLDING, SPRINGBACK SHELF BRACKET

Marshall J. Barrash, Atlanta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Oct. 22, 1981, Ser. No. 314,039
Int. Cl.³ A47G *29/02*
U.S. Cl. 248—240.4 17 Claims



1. A spring-biased shelf bracket which comprises:

a back member;

a shelf support member movable relative to said back member;

hinge means for permitting movement of said shelf support member relative to said back member and for maintaining said members in spaced relation to each other;

a mounting flange provided on at least said back member for mounting said bracket to a surface;

channel means provided at peripheral portions of said back member, shelf support member, and said hinge means; and

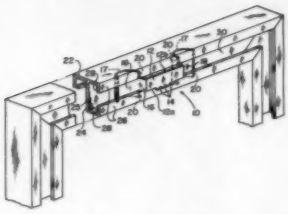
spring means associated with said channel means for biasing said back member, shelf support member and hinge means into first positions relative to each other and for permitting movement of said members and hinge means into at least second positions.

4,420,138

SELF-LOCKING PICTURE FRAME CLIP

David D. Sobel, 15415 N. 22nd St., Phoenix, Ariz. 85022

Filed Aug. 6, 1981, Ser. No. 290,618
Int. Cl.³ A47G *1/24*
U.S. Cl. 248—496 10 Claims



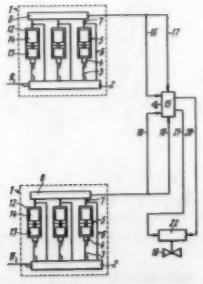
1. A clip adapted for use in a picture frame that has a channel with a base, the clip comprising an elongate planar shelf whose longitudinal ends are bent to form a pair of opposed angularly depending legs, the distal end of each leg, in plan view, widening along an abrupt discontinuity of cross-section into a foot that is sized to fit into the channel, said discontinuity of cross-section thereby defining an edge to frictionally engage facing, inside surfaces of the channel, the vertical height of each foot being dimensioned with respect to the height of the channel so that when said planar shelf is depressed, said edge of each foot is released from engagement with the facing, inside surfaces of the picture frame channel to allow the clip to slide relative thereto along the base.

4,420,139

DEVICE FOR REMOTE CONTROL AN ACTUATOR OF A SHUT-OFF MEMBER

Valentin V. Belov, Klenovy bulvar, 8, kv. 47, and Vsevolod I. Verkevich, ulitsa Moldagulovoi, 18, korpus 2, kv. 254, both of Moscow, U.S.S.R.

Filed Aug. 20, 1980, Ser. No. 179,734
Int. Cl.³ F16K *31/122*
U.S. Cl. 251—28 1 Claim



1. A device for remote control of the actuator of a shut-off member, said device connected by means of first and second control channels, for respectively opening and closing said shut-off member, to a remote control system, comprising:

an autonomous source of energy including a first unit and a second unit;

each one of said units of said autonomous source of energy comprising

at least two gas generators having an output and an igniter means;

a pneumatic OR gate having an output and inputs connected to said outputs of said gas generators; and

a selector having outputs connected to said igniter means of said gas generators, control inputs connected to said outputs of said gas generators, and an input of said selector of said first unit of said autonomous source of energy connected to said first control channel and an input of said selector of said second unit of said autonomous source of energy connected to said second control channel;

said device further comprising:

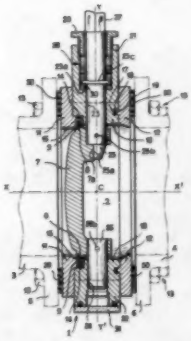
a distributor connected to said actuator of said shut-off member having first and second input channels and first and second control channels, said output of said OR gate of said first unit of said autonomous source of energy connected to said first input channel and to said first control channel of said distributor, and said output of said OR gate of said second unit of said autonomous control source connected to said second input channel and said second control channel of said distributor, wherein gases from the outputs of said OR gates of said first and second units effect operation of said distributor to selectively and alternately open and close said shut-off member.

4,420,140

BUTTERFLY VALVE AND A METHOD OF MANUFACTURE OF SAID VALVE

Jean Gachot, 26 bis, avenue de Paris, 95230 Soisy Sous Montmorency, France

Filed Apr. 17, 1980, Ser. No. 140,999
Claims priority, application France, May 4, 1979, 79 11275
Int. Cl.³ F16K *1/22*; B23P *15/00*
U.S. Cl. 25—152 8 Claims



1. A butterfly valve comprising a valve body traversed by a passageway which is adapted to be disposed between two end portions of a piping system, and a butterfly valve disk rotatably mounted within the valve body and displaced laterally with respect to the axis of rotation thereof which is disposed transversely to said passageway, an annular bearing surface at the periphery of said valve disk and adapted to bear on a valve seat within the passageway, the valve body comprising an annular member having two opposite chimneys which are directed transversely to said passageway and in which shaft means are mounted for rotational displacement of the valve disk, the annular member being mounted between first and second bearing rings which are radially thicker than the wall of the

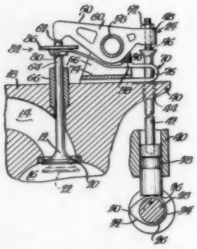
annular member in regions apart from the chimneys, the valve seat being located in a recess in one annular end of the annular member and being disposed between one face of said recess and a flange projecting from said first bearing ring and fitting into said recess, sealing means disposed between the second bearing ring and the annular member, each of said bearing rings having an external radius which is larger than that of the annular member apart from the chimneys, mutual centering means coupling the annular bearing member and said second bearing ring, and means for centering said annular member and both bearing rings with respect to the piping system.

4,420,141

VARIABLE RATE VALVE SPRING

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 26, 1981, Ser. No. 296,405
Int. Cl.³ F16F *1/00*
U.S. Cl. 251—337 **24 Claims**



1. In a valve train assembly **(24)** including a valve **(12)**, a cam **(26)** engaging a cam follower **(36)**, for moving said valve **(12)** through an intermediate position (K) between a seated position (J) and a maximum lift position (L), and spring means **(70/93)** for urging the valve **(12)** toward its seated position (J), the improvement comprising:

said spring means **(70/93)** having a first end **(82/116)**, a second end **(72/108)**, a preselected intermediate portion **(88/97)**, a first effective length from said first end **(80/116)** to said intermediate portion **(88/97)** and a second effective length from said first end **(80/116)** to said second end **(72/108)**, said spring having a first spring rate over said first effective length and a second spring rate over said second effective length, said second spring rate being of a lesser magnitude than said first spring rate; and

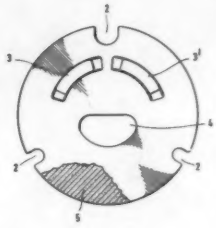
stop means **(90/92/98)** for preloading said spring means **(70/93)** at said intermediate portion **(88/97)**, only said first effective length being active in response to said valve moving between the seated position (J) and the intermediate lift position (K), said preload on said spring means **(70/93)** being overcome in response to said valve reaching the intermediate lift position (K), said second effective length being active in response to said valve moving between said intermediate position (K) and said maximum position (L).

4,420,142

MACHINE COMPONENT OF OXIDE CERAMIC MATERIAL

Ulf Dworak, Baltmannsweiler; Hans Jud, Esslingen; Hans Olapinski, Aichwald; Dieter Fingerle, Hochdorf, and Ulrich Krohn, Leonberg, all of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 1, 1981, Ser. No. 279,246
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 3025596
Int. Cl.³ F16K *11/00*
U.S. Cl. 251—368 **7 Claims**



1. A machine component for sliding contact and sealing action with and structural support of another component comprising said machine component containing from about

(a) 3.0–25 weight percent of zirconium oxide, hafnium oxide or mixtures thereof which are present at room temperature, predominantly in the metastable, tetragonal modification, in the interior of the machine component and, in the monoclinic modification, at the surface of the machine component;

(b) a structural support section expressed as profile bearing ratio of 10 to 40%; and

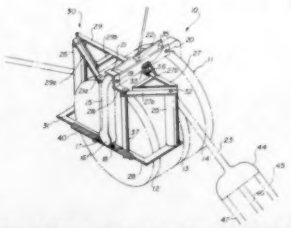
(c) an center line average surface roughness R_a of less than 0.3 μm.

4,420,143

LINE STRING BLOCK ATTACHMENT

William J. Harris, Rte. 1, Box 245, Russell, N.Y. 13684

Filed Dec. 15, 1981, Ser. No. 330,895
Int. Cl.³ H02G *1/02*
U.S. Cl. 254—134.3 PA **9 Claims**



1. An attachment for a stringing block or the like for guiding cable on a block sheave when preceeding or successive cable towers or poles are not linearly aligned comprising in combination:

means on said attachment affixed to a carriage of the stringing block for supporting said attachment,

said attachment including first and second positions,

said first position oriented to engage, guide and constrain the

cable and having manually activated locking means to maintain said first position,

said second position oriented to be retracted from the cable,

and biasing means to move said attachment from said first position to said second position upon release of said manual locking means whereafter the stringing block supports the cable solely,

a first cable engaging surface formed as an elongate roller rotatably mounted on a roller axle which forms a portion of said attachment, said roller rotates in a fixed radius arc from said first to said second position,

and a lower and upper support arm on said roller axle at extremities thereof, said support arms connected to a further axle for synchronous movement of said support arms, said further axle connected to an upper mounting bracket supported on said carriage and to a tang on a lower carriage portion, said biasing means connected to said lower support arm, said support arms connected to the stringing block whereby motion of said attachment from said first position to said second position causes rotation of said upper and lower support arms about an arc of a circle relative to the area of attachment to the stringing block as the center of curvature, and said roller and roller axle move in a peripheral path about said support arms defining and generating a cylinder.

4,420,144

MANUAL HOISTING AND PULLING APPARATUS

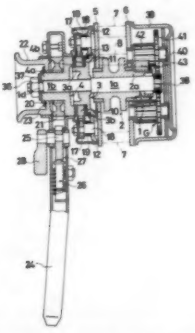
Koji Nishimura, Rittocho, Japan, assignor to Vital Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 13, 1981, Ser. No. 310,839

Claims priority, application Japan, Oct. 21, 1980, 55-147956; Dec. 25, 1980, 55-188828

Int. Cl.³ B66D *1/04*

U.S. Cl. 254—345 **6 Claims**



1. In a hand hoist including a load sheave disposed between a pair of side plates and supported on a drive shaft, an operating lever associated with one end of the drive shaft to rotate said shaft, a drive member and a driven member provided between the operating lever and one of the side plates and screwed on a threaded portion of the drive shaft, a reverse rotation preventing assembly provided between the drive member and the driven member, and a train of transmission gears provided between the other end of the drive shaft and the load sheave including an axially movable pinion on said drive shaft removably engageable with intermediate gears, the improvement comprising a drive shaft holding member rotatably mounted on the driven member so that it is axially movable with the driven member and substantially non-rotatable irrespective of rotation of the driven member, and a stop member mounted on said one of the side plates and movable to selectively overlap opposite sides of said holding member to retain the pinion on the other end of the drive shaft engaged with or disengaged from the intermediate gears.

4,420,145

WALKING BEAM FURNACE FOR HEATING METALLURGIC MATERIALS WITH DIFFERENT INLET TEMPERATURES

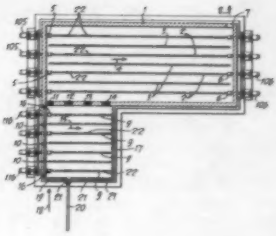
Iacopo Martini, Genoa, Italy, assignor to Italimpianti Societa Italiana Impianti, p.A., Genoa, Italy

Filed Mar. 1, 1982, Ser. No. 353,094

Claims priority, application Italy, Mar. 31, 1981, 12482 A/81

Int. Cl.³ F27B *9/14*

U.S. Cl. 266—90 **9 Claims**



1. A walking beam furnace for heating metallurgical materials such as billets, blooms, bars and the like, comprising:

a plurality of successive side doors along said furnace;

external conveyor means along at least one side of said furnace, said external conveyor means being located adjacent to said side doors;

internal conveyor means within said furnace, said internal and external conveyor means advancing with corresponding speed and direction;

introduction means for introducing materials into said furnace, said materials passing from said external conveyor means through any of said side doors to said internal conveyor means;

discharge means for discharging materials from said furnace, said materials passing from said internal conveyor means through any of said side doors to said external conveyor means; and

detection and control means for detecting temperature and cross-section of said materials and controlling introduction and discharge of said materials through said side doors of said furnace, said detection and control means thereby providing said materials, regardless of shape or initial temperature, with a substantially uniform temperature upon discharge from said furnace.

4,420,146

APPARATUS FOR OPENING FOLDED, BOUND OR STITCHED MULTI-SHEET PRODUCTS, ESPECIALLY PRINTED PRODUCTS

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Dec. 8, 1980, Ser. No. 214,461

Claims priority, application Switzerland, Jan. 5, 1980, 304/80

Int. Cl.³ B65H *5/30*

U.S. Cl. 270—55 **15 Claims**

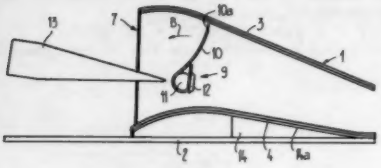
1. An apparatus for opening folded, bound or stitched multi-sheet products of a generally planar configuration, especially printed products, comprising:

a separation element capable of being introduced between the sheets of a respective product as a relative movement is effected between the product and the separation element, whereby an open side of the product is displaced past the separation element at a leading open side of such product;

means for accomplishing relative movement between the product and the separation element;

said separation element comprising an essentially flat, rotatable opening element;

means for rotating said rotatable opening element about an axis of rotation which is substantially parallel to a plane defined by the product to be opened;



said rotatable opening element piercingly entering between the sheets of the product which practically completely bear upon one another; and

said rotating means including means mounting said opening element in a position relative to the product such that said opening element, when subsequently rotated after it has piercingly entered the sheets of the product, separates the sheets located at one side of the opening element from the remaining sheets of the product.

4,420,147

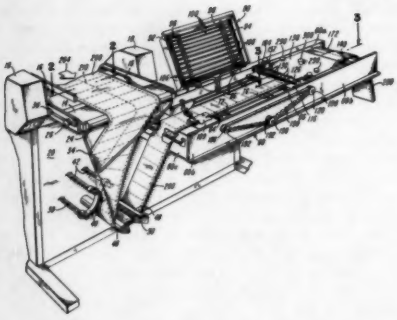
WEB FOLDING AND SEALING MACHINE

William J. Knox, and Byron C. Hall, both of Dayton, Ohio, assignors to The Standard Register Company, Dayton, Ohio

Continuation-in-part of Ser. No. 329,756, Dec. 11, 1981. This application Jul. 9, 1982, Ser. No. 396,797

Int. Cl.³ B41L *43/12*; B31B *23/00*

U.S. Cl. 270—37 **4 Claims**



1. Apparatus for sealing a continuously moving continuous folded web which carries solidified glue on selected areas of longitudinally extending regions thereof between the folded parts of the web comprising:

elongate support structure including first and second aligned sections along which the continuous folded web is movable,

a plurality of pairs of elongate heater strips, there being a plurality of laterally spaced-apart elongate lower heater strips and a plurality of laterally spaced-apart elongate upper heater strips in the first section of the support structure, each upper heater strip being directly above one of the lower heater strips along the length thereof, the pairs of heater strips being substantially parallel to each other and parallel to the longitudinal axis of the elongate support structure so as to be aligned with the longitudinally extending regions,

support means supporting the upper heater strips and movable with respect to the lower heater strips for movement of the upper heater strips toward and away from the lower heater strips,

a pair of closely spaced parallel conterminous thermal conductor plates in the second section of the elongate support structure,

a first pressure roller positioned between the first section and the second section of the elongate support structure and extending transversely across the elongate support structure, a plurality of elastomeric pressure rings tightly encompassing the first pressure roller, there being one elastomeric pressure ring in alignment with each pair of the elongate heater strips, a second pressure roller parallel to the first pressure roller and closely spaced with respect thereto,

the folded web moving along the first section of the elongate support structure and between the upper heater strips and the lower heater strips for melting the glue which is between the folded parts of the folded web and which is between the pairs of spaced-apart elongate heater strips, the folded web then moving between the closely spaced pressure rollers as the elastomeric pressure rings of the first pressure roller and the second pressure roller apply pressure to the longitudinally extending regions of the folded parts of the web which have traveled between the pairs of heater strips and to the melted glue between the folded parts of the web, the folded web then moving between the thermal conductor plates for cooling the web and for soidifying the glue as the folded web travels between the thermal conductor plates, the support means being movable with respect to the lower heater strips to move the upper heater strips from the lower heater strips to provide access to the portions of the folded web which are positioned between the lower heater strips and the upper heater strips.

4,420,148

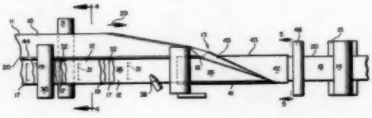
METHOD AND APPARATUS FOR FOLDING A COVER STRIP OVER A MULTI-PLY INNER STRIP

Clayton D. Meadows, Itasca, Ill., assignor to The Wessel Company, Inc., Elk Grove Village, Ill.

Filed Mar. 22, 1982, Ser. No. 360,449

Int. Cl.³ B41L *43/04*

U.S. Cl. 270—41 **9 Claims**



1. In a booklet manufacturing process, a method for folding a cover strip having a transverse slit over a multi-ply inner strip, said method comprising the steps of:

providing one continuous strip of paper having first and second parts extending in adjacent relationship along a longitudinal folding line, with transverse slits at longitudinally spaced intervals on said first part;

said first part having a transverse dimension;

advancing said one continuous strip longituninally in a downstream direction along a predetermined path having a downstream portion;

providing another continuous strip of paper having multiple plies longitudinally folded in nested relation along a line to define a spine for said other strip along the fold line for said plies, said other continuous strip having a transverse dimension corresponding substantially to the transverese dimension of said first part on said one strip;

advancing said other continuous strip longitudinally in a downstream direction along a predetermined path and above said first part on said one strip, said predetermined

path of the inner strip having a downstream portion corresponding to the downstream portion of the path of said cover strip;
providing a folding station at a predetermined location on said downstream path portion;
laying said other strip atop the first part of said one strip upstream of said folding station, whereby the first part of the one strip becomes a bottom cover under the second strip;
said one strip lying in a plane as said strip advances toward said folding station;
tensioning said one strip in the plane thereof, at said folding station, to avoid slack in said strip;
folding said second part of the tensioned one strip along said longitudinal folding line, out of the plane of the one strip and then over and atop said multi-ply second strip to provide a top cover over the second strip and a longitudinal edge at said folding line;
controlling the tension in said one strip during said folding step to avoid transverse tearing on said first part thereof from said transverse slit to said longitudinal folding line;
supporting said first part of the one strip from below during said folding step;
urging said second part of the one strip downwardly toward said other strip as the strips move downstream during said folding step;
urging said longitudinal edge in a transverse direction toward said other strip during said folding step;
applying a longitudinally extending line of adhesive on said one strip adjacent said longitudinal folding line, prior to said laying step;
and adhering said spine to said one strip at said line of adhesive, after said applying step.

4,420,149

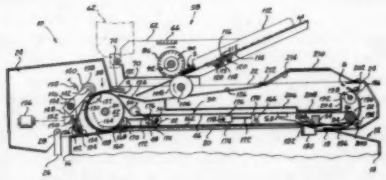
AUTOMATIC ORIGINAL DOCUMENT FEEDER FOR ELECTROPHOTOGRAPHIC COPIER

Max Schultes, Old Tappan, N.J., and Dietmar Eberlein, Wappingers Falls, N.Y., assignors to Savin Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 97,554, Nov. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 7,370, Jan. 29, 1979, abandoned. This application May 20, 1981, Ser. No. 265,393

Int. Cl.³ B65H *1/04, 3/06*

U.S. Cl. 271—10 **5 Claims**



1. Document transport apparatus for use with a copier having an imaging station, said apparatus including in combination means forming an inlet for receiving documents, means forming a generally horizontal guide surface facilitating manual introduction of documents into said inlet, a document support for receiving a stack of documents, said support having an end, means for automatically advancing documents from said end of the support, means mounting said support and said advancing means for constrained movement between first and second limit positions relative to said inlet-forming means and said guide surface while remaining continuously attached thereto, said support and said advancing means overlying said guide surface in said first limit position with said end adjacent said inlet and overlying said inlet in said second limit position to expose said guide surface and permit manual introduction of a document into said inlet, said advancing means being operative in the first position to introduce documents from said support into said inlet, and means operable in each of said positions of said support and said advancing means for transporting a document introduced into said inlet to said imaging station.

4,420,150

APPARATUS AND METHOD FOR SEPARATING A SINGLE SHEET FROM A STACK AND CONVEYING IT

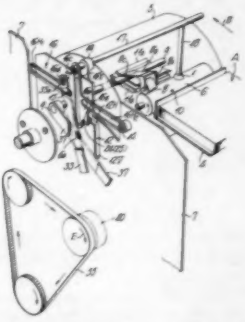
Michio Umezawa, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Dec. 17, 1980, Ser. No. 217,553

Claims priority, application Japan, Dec. 19, 1979, 54-166026; Dec. 25, 1979, 54-168746

Int. Cl.³ B65H *3/08, 7/18*

U.S. Cl. 271—11 **19 Claims**



1. An apparatus for separating sheets individually from a stack of sheets and conveying the separated sheets individually to a selected location comprising:
at least one suction device;
means associated with each said suction device for connecting it to a source of suction; and
drive means associated with each said suction device for moving it adjacent the uppermost sheet in said stack for attracting said uppermost sheet thereto by suction, thereafter tilting each said suction device to thereby separate any underlying sheets attracted thereto and then moving each said suction device towards said location to transport said uppermost sheet thereto, said drive means including adjusting means connected to each said suction device for adjusting the angle of tilt thereof according to characteristics of the sheet in said stack, said adjusting means including means for determining the thickness of a sheet from said stack and means associated with said thickness-determining means for adjusting said angle of tilt automatically as a function of thickness determined for the sheet.

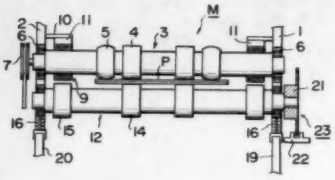
10. An apparatus for separating sheets individually from a stack of sheets and conveying the separated sheets individually to a selected location, comprising:
at least one suction device;
means including a conduit connected with each said suction device for connecting it to a source of suction;
drive means connected to each said suction device for moving it adjacent the uppermost sheet in said stack for attracting it thereto by suction and thereafter moving each said suction device towards said location; and
said conduit being formed with an opening leading to the ambient and located between each said suction device and the source of suction, and means provided over said opening for receiving another sheet comparable to the sheet to be attracted by each said suction device for covering said opening by said another sheet.

4,420,151

OVERLAPPING FEED DETECTION DEVICE IN SHEET-PROCESSING MACHINE

Tetsuji Kobayashi, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Aug. 17, 1981, Ser. No. 293,261
Int. Cl.[3] B65H 7/12
U.S. Cl. 271—263 5 Claims



1. In an overlapping feed detection device for use in a machine for processing paper money, slips, checks, or like sheets, said detection device being of the type including propelling means driven by motive power means and operating to successively propel sheets to be processed, a driven rotatable structure rotatably supported to parallelly confront said propelling means and to be separable therefrom and approachable thereto, a gate gap being formed between said propelling means and said driven rotatable structure for passage therethrough normally of a single sheet at one time, said gap being widened when two or more sheets in overlapping state pass therethrough to force said driven rotatable structure to undergo a displacement away from said propelling means, and detecting means for detecting said displacement thereby to detect the overlapping feed of the sheets, the improvement comprising:

a driving shaft formed integrally and coaxially with said propelling means;

a driven shaft formed integrally and coaxially with said driven rotatable structure;

bearings including inner races fixedly mounted on said driving shaft to rotate unitarily therewith and outer races;

a holding mechanism including holding members normally holding said outer races against rotation;

pressing rollers formed integrally with said driven shaft and said driven rotatable structure;

elastic members urging said pressing rollers normally into pressing contact with said outer races;

whereby said gate gap for passing only a single sheet is formed between said propelling means and said driven rotatable structure when said pressing rollers are in pressing contact with said outer races, and said pressing contact prevents said pressing rollers, said driven shaft and said driven rotatable structure from rotating;

whereby, when two or more sheets in an overlapping state cause a widening of said gap and a displacement of said driven rotatable structure away from said propelling means, said pressing contact is released, thereby enabling rotation of said pressing rollers, said driven shaft and said driven rotatable structure; and

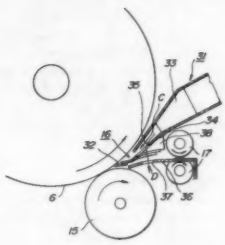
rotation detecting means for detecting the rotation of said driven rotatable structure.

4,420,152

APPARATUS FOR PEELING OR SEPARATING A RECORD PAPER FROM A PHOTOSENSITIVE DRUM OF AN ELECTROPHOTOGRAPHIC COPYING MACHINE

Kiyoshi Miyashita, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Continuation of Ser. No. 116,825, Jan. 30, 1980, abandoned. This application Aug. 10, 1981, Ser. No. 291,773
Claims priority, application Japan, Feb. 2, 1979, 54-11135
Int. Cl.[3] B65H 29/56
U.S. Cl. 271—309 12 Claims



1. An apparatus for peeling a record paper having a toner image transferred thereon by means of a transferring member off a charge retentive member of an electrophotographic copying machine, comprising: a pair of pawls, each of said pawls employed to peel a respective side edge of the record paper from the charge retentive member; a duct for blowing an air stream in a space between the record paper and the charge retentive member; and first and second guide plates arranged substantially in parallel with each other for defining a passage through which the record paper peeled off the charge retentive member is fed in such a manner that the toner image retentive surface of the record paper is opposed to an inner surface of the first guide plate, at least one opening being formed in the first guide plate, through which opening an air stream is introduced into said passage so as to press the record paper against the second guide plate, a front edge of said first guide plate is recessed in a V-shaped manner in the paper feeding direction, and the record paper does not strike against the front edge of said first gude plate.

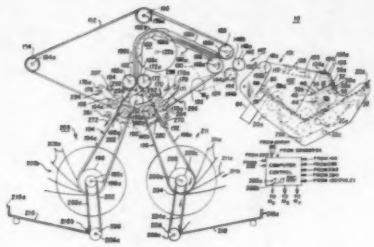
9. An apparatus for peeling a record paper having a toner image transferred thereon by means of a transferring member off a charge retentive member of an electrophotographic copying machine, comprising: a pair of pawls, each of said pawls employed to peel a respective side edge of the record paper from the charge retentive member; a duct for blowing an air stream in a space between the record paper and the charge retentive member; and first and second guide plates arranged substantially in paralllel with each other for defining a passage through which the record paper peeled off the charge retentive member is fed in such a manner, that the toner image retentive surface of the record paper is opposed to an inner surface of the first guide plate, at least one opening being formed in the first guide plate, through which opening an air stream is introduced into said passage so as to press the record paper against the second guide plate, a front edge of said first guide plate is recessed in a convex manner in the paper feeding direction and is bent in a convex manner in a direction perpendicular to the paper feeding direction, whereby a curved front edge of the record paper does not strike against the front edge of said first guide plate.

4,420,153

DOCUMENT HANDLING COUNTING AND EXAMINING DEVICE INCORPORATING HIGH SPEED ROTARY GATING MEANS

Theodore Winkler, Levittown, and Frank J. Reed, Philadelphia, both of Pa., assignors to Brandt, Inc., Bensalem, Pa.

Filed Sep. 19, 1980, Ser. No. 188,906
Int. Cl.³ B65H 29/60
U.S. Cl. 271—304 39 Claims



1. Means for selectively diverting sheets comprising:

delivery means engaging the opposing major faces of sheets for delivering sheets in a single file along a substantially linear path in a spaced apart fashion towards a diverting location as each sheet leaves said delivery means;

elongated revolvable means positioned in said linear path of movement of said sheets and revolvable about an axis lying in said path of movement;

said delivery means including first and second moving guide means arranged adjacent one another for engaging opposing major faces of sheets along a portion of said linear path and extending abruptly away from one another at a point where the sheets leave the influence of said guide means, the portions of the first and second guide means extending away from each other serving as moving guides on opposite sides of said revolvable means;

means for continuously rotating said revolvable means in a first direction at high speed for diverting sheets engaging the periphery of said revolvable means in a first direction away from said linear path and towards said first guide means and for continuously rotating said revolvable means in a second direction at high speed for diverting sheets engaging the periphery of said revolvable means in a second direction away from said linear path and towards said second guide means;

first and second acceleration means forming a nip positioned adjacent said first and second moving guide means and downstream of said revolvable means, for abruptly accelerating a sheet as its leading edge enters the nip for delivery to a collection location associated with each acceleration means;

the nips of said accelerating means each being arranged to selectively receive the leading edge of a sheet, while its trailing edge is still between the first and second moving guide means;

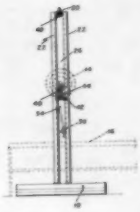
said moving guide means being arranged relative to one another to exert a driving force upon sheets which gradually decreases over said portion of said linear path, enabling the acceleration means to accelerate a sheet whose leading edge has entered the nip of the acceleration means before the trailing portion of the sheet leaves said linear path portion, where it is engaged by said first and second moving guide means.

4,420,154

WEIGHTLIFTING APPARATUS

John T. Ramsey, and William J. Ramsey, both of 3807 S. Webb Rd., Wichita, Kans. 67210

Filed Nov. 12, 1980, Ser. No. 205,929
Int. Cl.³ A63B 21/06
U.S. Cl. 272—118 5 Claims



1. A weightlifting apparatus for preventing injury to a weightlifter from a weightlifting bar including weights thereon in the event of physical collapse of the weightlifter comprising a framework having a base, a brace, a first pair of vertical support members generally being secured to one end of said brace and to said base, and a second pair of vertical support members generally securing to the other end of said brace and to said base, said vertical support members of said first pair being positioned in proximity to each other creating a first slot and each vertical support members of said first pair including a structure defining a plurality of first slot apertures, said vertical support members of said second pair being positioned in proximity to each other creating a second slot and each vertical support members of said second pair including a structure defining a plurality of second slot apertures, said first slot apertures in said first pair vertical support members and said second slot apertures in said second pair vertical support members being in registry, adjustment means is slidably and adjustably mounted within said first slot and within said second slot for supporting said weightlifting bar and adjusting the height of same with respect to the weightlifter, and fine adjustment means mounted on each of said adjustment means for additionally supporting said weightlifting bar and closely adjusting the height of said bar relative to the weightlifter, said weightlifting apparatus preventing injury to the weightlifter as said weightlifting bar rides within said first and second slots in that if the weightlifting bar and weights are dropped by the weightlifter the fine adjustment means and adjustment means will arrest the falling before injurying the weightlifter, each of said adjustment means comprises a generally rectangular body having a structure defining a plurality of adjustment apertures, at least two pin means for retaining said adjustment means in said first slot and in said second slot, by inserting one of said pin means through said first slot apertures of one first pair vertical support members, said adjustment apertures of one adjustment means, and through said first slot apertures of the other first pair vertical support members, in order stated, for retaining one of the adjustment means in said first slot, and by inserting the other of said pin means through said second slot apertures of one second pair vertical support members, through said adjustment apertures of another adjustment means, and through said second slot apertures of the other second pair vertical support members, in order stated, for retaining the other adjustment means within the second slot, said fine adjustment means comprising a bolt-like member threadably engaging each of said adjustment means; and a plate-like member positioned between each of said fine adjustment means and said adjustment means for stabilizing each of the combined fine adjustment means and adjustment means within the first slot and within the second slot.

4. A process comprising the steps of:

(a) placing a bar height adjustment device within a first slot between a first pair of vertical support members and

within a second slot between a second pair of vertical support members so as to register apertures in the adjustment devices with the apertures in the vertical support members;

(b) inserting a first pin through apertures in the support members and the adjustment devices so as to hold the devices in the slots;

(c) attaching a bar height fine adjustment device to each adjustment device for closely adjusting the final height of a weightlifting bar relative to a user and for supporting a weightlifting bar and arresting the fall of a bar in the event a weightlifting bar is dropped by the user;

(d) stabilizing each fine adjustment device and adjustment device within the slots by positioning a plate between each of the fine adjustment devices and the adjustment devices; and

(e) threadably adjusting the fine adjustment device so as to vary the height of a weightlifting bar relative to a user.

4,420,155

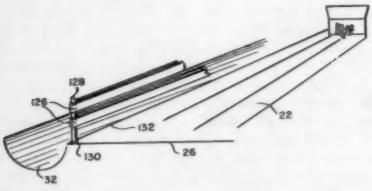
CONVERTIBLE BOWLING ALLEY

Zena Sheinberg, and Alex Wortman, both of 526 Pauline Blvd., Ann Arbor, Mich. 48103

Division of Ser. No. 108,033, Dec. 26, 1979, Pat. No. 4,330,122. This application Feb. 19, 1982, Ser. No. 350,323

Int. Cl.³ A63D *5/00*

U.S. Cl. 273—51 **2 Claims**



1. An improved bowling alley of the type comprising a bowling lane bed including an approach and a foul line at one end and a pin deck at the other end thereof and a pair of elongated gutters parallel to and abutting each side of said bowling lane bed, wherein the improvement comprises deflection means removably disposed longitudinally along both sides of said lane bed and outside of said gutters for deflecting a bowling ball rolled down said alley to thereby prevent said ball from falling into said gutters, said deflection means extending substantially along each side of said lane bed between said foul line and said pin deck, and upright pin support means removably disposable at its lower end in respective openings located in the corners formed by the said foul line and the contact lines of said lane bed and said gutter, and the corners formed at the distant end of said lane bed near said pin deck and at the contact line of said lane bed and said gutter, said deflection means being removably supported vertically above said lane bed by said upright pin support means whereby said bowling alley can serve as a conventional alley when said deflection means and said upright pin support means are removed and can serve as a carom bowling alley when said deflection means are supported in place.

4,420,156

IRON-TYPE GOLF CLUBS

Daniel N. Campau, Grand Rapids, Mich., assignor to Pepsico, Inc., Purchase, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,460

Int. Cl.³ A63B *53/00*

U.S. Cl. 273—77 A **18 Claims**

1. A set of at least four iron-type golf clubs, each club of the set having a shaft and a head connected to the shaft, each head having:

a sole having a leading edge and a trailing edge;

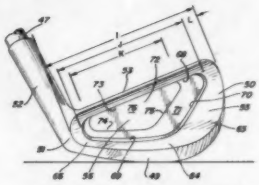
a toe,

a heel,

a flat striking face extending upwardly from the leading edge of the sole between the toe and the heel, the striking face extending at a different loft angle for each club of the set,

a rear face extending upwardly from the trailing edge of the sole between the toe and the heel, and

a cavity in the rear face, the cavity having a bottom wall which is spaced above the sole to provide a sole-weighting portion of the head between the sole and the cavity bottom wall and a side wall which is spaced from the toe to



provide a toe-weighting portion of the head between the toe and the cavity side wall, the thickness, width, and weight of the sole-weighting portion and the toe-weighting portion of each head being such that:

(a) the center of gravity of each head is spaced progressively farther behind the striking face as the loft angle decreases;

(b) the moment of inertia of each head with respect to an axis of rotation of the head which passes through the center of gravity progressively decreases as the loft angle decreases; and

(c) the radius of gyration of each head with respect to said axis of rotation is greater than 1.26 inch whereby each club provides gear effect spin to a golf ball which is struck by the club at a point which is on the toe side or the heel side of the center of gravity of the club.

4,420,157

APPARATUS FOR PLAYING A GAME

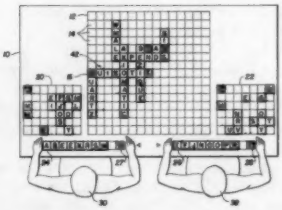
Peter H. White, and Patricia M. White, both of Apartado 164, Estepona, Malaga, Spain

Filed Feb. 16, 1982, Ser. No. 349,363

Claims priority, application United Kingdom, Feb. 26, 1981, 8106156

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—272 **10 Claims**



1. Apparatus for the playing of a game by only two participants, the apparatus comprising means that is planar when in use and that is marked with a single game area which defines a plurality of adjoining identically dimensioned spaces substantially all of which are plain and unmarked, said means further being marked to define one reserve area and one play area for use by each of the two participants, a plurality of playing pieces each of which is planar and is marked on both opposite

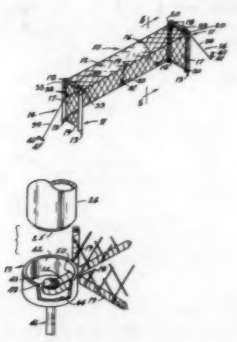
sides with a single letter of the alphabet or with a symbol denoting universal use, each playing piece being assigned a scoring value, and rules for playing a game with the apparatus which rules require the initial allotment of an equal set of lettered playing pieces and one universal playing piece to each of the two game participants for disposal in the respective reserve areas of said means, an initial secret selection by each participant of the same previously agreed number of not less than two and not more than ten of his/her allotted playing pieces for transfer from that reserve area to the respective play area, and the formation of conjoined words in crossword format in the adjoining spaces of the game area, such words yielding scores determined by the total letter values involved, the taking by the two participants of alternate turns using playing pieces selected from their respective play areas, and the subsequent restoral of the preselected number of playing pieces in their respective play areas at each turn by replenishment from the corresponding reserve areas, and wherein the rules also require all the playing pieces to remain fully visible to both participants once said initial secret selections thereby have been made in each game and the participants have signified that they are ready to continue that game.

4,420,158

PORTABLE SPORTS FIELD GOAL ASSEMBLY

Lawrence E. Klock, Spokane, and Randall J. Broweleit, Renton, both of Wash., assignors to Soccer Stuff, Inc., Seattle, Wash.

Filed Oct. 2, 1981, Ser. No. 307,801
Int. Cl.³ A63B *63/00*
U.S. Cl. 273—400 **7 Claims**



1. A portable field goal assembly, comprising:

a pair of end frames, each including a pair elongated upright support members having bottom ends and interconnected by a cross member;

an elongated goal net having longitudinal sides and transverse ends joined at corners and having a peripheral rope frame defining the ends, sides and corners;

ground cups each having a peripheral wall defining an upwardly open recess for slidably receiving the bottom end of one elongated support member and having a horizontal bottom surface with a preformed aperture formed therethrough within said recess;

spike means received through the ground cup apertures for securing the ground cups and the attached frame members to the ground surface at spaced apart locations;

guy means operatively connected to the end frames adapted to be secured to the ground surface, for holding the end frames in upright operative positions with the net stretched between the end frames; and

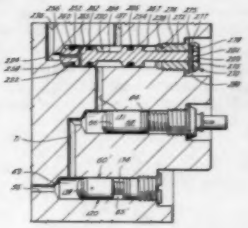
means for operatively attaching the net to the end frame and to the spike means adjacent the net ends.

4,420,159

PACKER VALVE ARRANGEMENT

Edward T. Wood, Kingwood, Tex., assignor to Completion Tool Company, Houston, Tex.

Filed Aug. 13, 1982, Ser. No. 407,898
Int. Cl.³ E02D *5/00*; E21B *33/12*
U.S. Cl. 277—34 **13 Claims**



1. In a tubular system having

a hollow tubular mandrel;

a packer attached to the mandrel at one end;

a valve collar mounted on the other end of the mandrel, the other end of the packer being attached to the collar and the collar being in fluid communication with the packer by a passage and the collar also being in fluid communication with the interior and exterior of the mandrel;

a valve system mounted on the mandrel, the valve system being in fluid communication with the packer and the interior and exterior of the mandrel, the valve system including at least one valve with at least one reciprocating member and a stop means for preventing reciprocation of the reciprocating member prior to the application of at least a predetermined pressure difference to the reciprocating member, the reciprocating member being located at one end of the passage when the stop means prevents reciprocation, the reciprocating member hving at least two seals thereon for preventing the flow of fluid from either side of the reciprocating member around the member to the passage;

the improvement comprising:

first means independent of the seals for permitting the flow of fluid from the interior of the mandrel to one side of one seal of the reciprocating member; and

second means independent of the seals for permitting the flow of fluid from the exterior of the mandrel to oppositely facing surface of the other seal of the reciprocating member; and

third means independent of the seals for equalizing the pressure on the other side of each of the seals to substantially that of the exterior of the mandrel.

4,420,160

FACE SEAL SYSTEM

Herman C. Laham, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Continuation of Ser. No. 129,080, Mar. 10, 1980, abandoned. This application May 28, 1982, Ser. No. 383,367
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—40 **10 Claims**

1. A seal system for a turbocharger for sealing passage of a rotatable shaft through a compressor backplate separating a turbocharger center housing and compressor housing from each other, comprising:

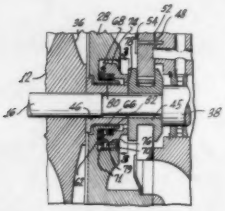
means integral with the backplate defining an annular recess opening axially toward the center housing said recess having a radially extending annular base wall bounded at its radially inner extent by an axially extending annular flange concentrically about the shaft, said recess being further bounded by at least one integral and radially pro-

jecting anti-rotation lug spaced axially from said base wall of said recess;

helical spring means receivable axially into said recess having a relatively low spring rate and a generally conical cross-section for compression substantially into a single plane;

a thrust washer having at least one slot formed therein for registry with said lug said thrust washer being receivable axially into said recess past said lug and then indexable with respect to said lug whereby said lug axially retains and limits axial travel of said thrust washer within said recess, said spring means exerting a force bearing axially against said thrust washer for urging said thrust washer in an axial direction toward said lug;

a generally annular seal member having at least one slot



formed therein for registry with said lug, said seal member being receivable axially into said recess into bearing engagement with said thrust washer and including a seal face presented axially toward the center housing for sealing engagement with respect to the shaft;

passage means formed in said backplate bounding the radially outer extent of said recess for communicating the fluid pressure within the center housing to the axial side of said thrust washer opposite said seal member for assisting said spring means in urging said seal face into sealing engagement with respect to the shaft when said fluid pressure in the center housing exceeds the fluid pressure in the compressor; and

an annular resilient seal ring concentrically between said seal member and said flange for preventing passage of fluid therebetween.

4,420,161

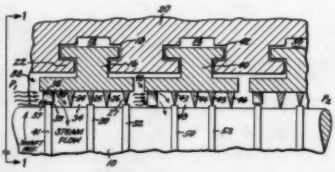
ROTOR STABILIZING LABYRINTH SEALS FOR STEAM TURBINES

Edward H. Miller, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 10, 1982, Ser. No. 376,247

Int. Cl.³ F16J *15/44, 15/40;* **F01D** *5/20*

U.S. Cl. 277—56 **10 Claims**



1. For use in a steam turbine having a central rotatable rotor, a labyrinth seal for minimizing leakage of the steam between a region of higher pressure and a region of lower pressure through which the rotor extends, such seal providing stabilization against rotational instabilities of the type caused by steam whirl and comprising, in combination:

a plurality of spaced-apart annular teeth affixed to a stationary portion of the turbine between said pressure regions and encircling the rotor substantially coaxially therewith to define chambers between the teeth, each tooth of said plurality of teeth extending radially inward to within close proximity of said rotor;

a row of circumferentially spaced-apart flow directing vanes affixed to the stationary portion of the turbine within said higher pressure region and encircling the rotor in proximity to said plurality of said annular teeth, each vane of said row having a portion of its planar surface being substantially radially aligned with respect to said rotor, and said planar surface of said vane being angularly inclined with respect to the axis of said rotor to direct steam passing therethrough into said chambers in a flow direction counter to the direction of rotor rotation; and

a raised annular land on the rotor surface opposite said row of vanes to produce an abrupt radially outward deflection of the steam flow passing axially near the surface of the rotor, the resultant outward flow being carried into the vacinity of said row of vanes so that substantially the entire flow of steam entering said chambers passes through said vane row and enters in a direction counter to the direction of rotor rotation.

4,420,162

MECHANICAL SEAL AND METHOD OF FORMING A SLIDING SURFACE THEREOF

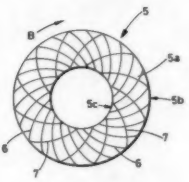
Tadamasa Yanai, Takahashi; Risaburo Sagehashi, Souja; Yoshio Kameyama, Souja, and Takao Shimomura, Souja, all of Japan, assignors to Eagle Industry Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1981, Ser. No. 317,814

Claims priority, application Japan, Nov. 4, 1980, 55-153840; Mar. 5, 1981, 56-30450

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—96.1 **18 Claims**

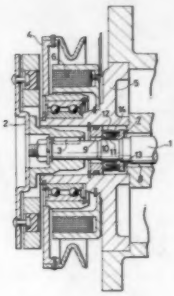


1. A mechanical seal comprising a seat ring fixed to a housing, a seal ring fixed to a rotating shaft, said seal ring rotating with said rotating shaft, said seat ring and said seal ring being in sliding contact with each other to prevent the leakage of fluid, and a plurality of fine grooves formed on a sliding surface of one of said rings, some of said fine grooves being inclined forwardly for performing a lubricating action and the remainder being inclined rearwardly to perform a pumping action, said grooves being inclined forwardly and rearwardly with respect to the relative rotational direction of said seal ring, each of said fine grooves respectively having ends extending to the outer peripheral edge and the inner peripheral edge of said sliding surface, said forwardly inclined grooves and said rearwardly inclined grooves intersecting one another such that sealing fluid is passable from said forwardly inclined grooves to said rearwardly inclined grooves at said intersections such that sealing fluid enters said seal via said forwardly inclined grooves and exits said seal via said rearwardly inclined grooves, said rearwardly inclined grooves being greater in number than said forwardly inclined grooves such that the discharge capacity resulting from said pumping action of said rearwardly inclined grooves is greater than the intake capacity of said forwardly inclined grooves.

4,420,163
MECHANICAL SEAL

Akira Takenaka, and Tatsuhiko Fukuoka, both of Toyota, Japan, assignors to Taiho Kogyo Co., Ltd., Toyota, Japan

Continuation of Ser. No. 87,905, Oct. 24, 1979, abandoned. This application Mar. 11, 1982, Ser. No. 356,990
Claims priority, application Japan, Oct. 25, 1978, 53-131406
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—96.1 13 Claims



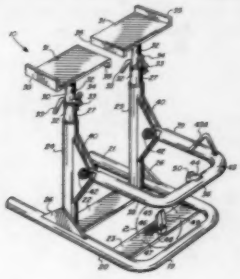
1. In a mechanical seal for sealing a rotatable shaft with respect to a wall which is stationary relative to said rotatable shaft, said mechanical seal comprising an annular seating ring non-rotatably mounted on the wall and an annular follower ring mounted on the shaft for rotation therewith, said seating ring and said follower ring having opposed transverse annular seal faces, and including means for urging said seal faces into face-to-face sealing and rotatable sliding engagement with each other for sealing a pressurized fluid present in a first zone surrounding said follower ring from a second zone inside said seating ring, which second zone communicates with the ambient air, the improvement which comprises: the radially outer portion of said seal face of said follower ring is an annular, smooth, uninterrupted, land portion extending from the periphery of said seal face partway across the radial width of said seal face, said land portion being in sealing and rotatable sliding engagement with the portion of said seating ring that is opposed to said land portion, and the annular, radially inner portion of said seal face of said follower ring has a multitude of radially and circumferentially spaced-apart, discrete cavities therein distributed over the surface of said radially inner portion, said cavities being spaced also from both the radially inner and radially outer edges of said follower ring seal face, with the entire perimeter of each cavity being surrounded and thus closed by the follower ring seal face, said cavities being only in said radially inner portion, the depth of each said cavity being in the range of from 0.01 to 1.0 mm, the smallest dimension across the mouth of each said cavity, namely the width thereof, being in the range of from 0.1 to 1.0 mm, said radially inner portion extending up to about two-thirds of the distance from the radially inner edge to the radially outer edge of said seal face of said follower ring, so that fluid that leaks in a radially inward direction between said seal faces enters said cavities and is urged radially outwardly by centrifugal force generated by rotation of said follower ring relative to said seating ring.

4,420,164
STAND FOR DIRT BIKES

Mark T. Mitchell, 8320 E. Indianola, Scottsdale, Ariz. 85251

Filed Jan. 15, 1982, Ser. No. 339,729
Int. Cl.³ B62H *3/10*
U.S. Cl. 280—293 10 Claims

10. A motorcycle stand comprising:
a base,
at least one vertically arranged hollow column mounted on said base,
said column having a collar mounted thereon in a telescopic arrangement for extending or reducing the combined length of said column and its associated collar,
a lever arm pivotally mounted on said column, the movement of which in a predetermined manner simultaneously moves said collar relative to its associated column,
a spring biased catch mounted on said base,

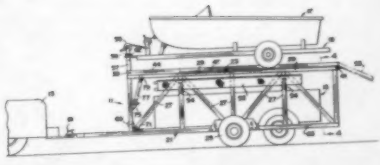


a clip mounted on said lever arm for engagement by said spring biased catch for holding the collar in a given position relative to said column when said lever arm is moved a predetermined distance in a given direction, and
a surface on said catch, said catch responsive to the contact of an operator's foot against said surface for disengaging said clip to permit a reduction of the combined length of said column and the associated collar by the weight of the motorcycle on the stand.

4,420,165
MULTI-TRAILER ASSEMBLY

William K. Goodin, 8518 Macoma Drive, St. Petersburg, Fla. 33702

Filed Nov. 12, 1980, Ser. No. 205,921
Int. Cl.³ B60P *3/08, 3/10*
U.S. Cl. 280—414.1 6 Claims



1. A trailer for simultaneously transporting a first boat vehicle and a second wheeled vehicle with a third vehicle comprising:
a first base member having two longitudinal horizontal portions joined at one end with a transverse horizontal section;
at least one trailer wheel independently attached to each longitudinal horizontal portion;
a second base member disposed above the first base member and having two longitudinal horizontal portions connected by at least two transverse horizontal sections;
a plurality of struts attached to and connecting the first and second base member;
a U-shaped frame pivotally connected to the second base member, and two wheel guides attached to the U-shaped frame for supporting the first vehicle theron;
means for connecting the first base member to a pulling vehicle; and

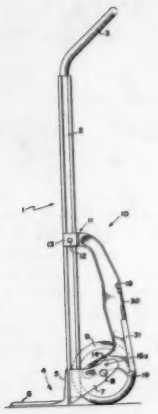
means for coupling the second vehicle to be transported to the first base member whereby the weight of the second vehicle to be transported is self-supported and the trailer wheels support only the weight of the first vehicle to be transported and the trailer.

4,420,166

STAIR CLIMBER FOR HAND TRUCKS

Don C. Law, Bay City; Carl N. Mortenson, Midland; Paul Ripple, Prudenville, and Roger S. Eckhardt, Bay City, all of Mich., assignors to Magline, Inc., Pinconning, Mich.

Filed Feb. 10, 1982, Ser. No. 347,529
Int. Cl.³ B62B *5/02*
U.S. Cl. 280—5.24 **19 Claims**



1. In a hand truck and stair climber construction wherein a two-handed truck has a pair of wheels; a frame adapted in use to assume a generally vertical position supported by said wheels, the frame having a forwardly projecting nose part to receive a load thereon; and rearwardly projecting stair climbers are mounted on said frame, the stair climbers comprising a body member having a flat web terminating at one edge in a flange, said flange having a first portion overhanging both sides of said web and a second portion overhanging at least one side of said web, said flange portions being separated by a gap, and abutments carried by said body member at opposite ends of and extending beyond said flange.

4,420,167

ASSEMBLY FOR STABILIZING A VEHICLE CHASSIS

Nils Winblad, Varmlandsvagen 10C, S-691 32 Karlskoga, Sweden

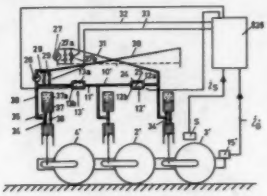
Continuation-in-part of Ser. No. 207,489, Nov. 17, 1980, abandoned, which is a continuation of Ser. No. 41,851, May 24, 1979, abandoned. This application Feb. 8, 1982, Ser. No. 346,797
Claims priority, application Sweden, Jun. 7, 1978, 7806643
Int. Cl.³ B60G *19/06*
U.S. Cl. 280—6 H **20 Claims**

11. A system for stabilizing a vehicle on uneven terrain, said vehicle having a chassis and at least three pairs of wheels, each wheel being independently mounted with respect to said chassis, said vehicle having a first and a second tilting axis, said vehicle also having a front and rear end and a first and second side,

(a) first and second means for generating first and second signals, said first signal being generated in response to rotational motion around said first axis, and said second signals being generated in response to rotational motions around said second axis,

(b) fluid suspension means for each of said wheels mounted between said wheels and said chassis,

(c) first and second bogie conduit means mounted on said first and second sides of said vehicle to interconnect the suspension systems mounted on said first and second sides of the vehicle, respectively, each of said bogie conduits being equipped with a valve means to provide bogie coaction between adjacent wheels when said valve means are activated,



(d) first and second diagonal conduit means interconnecting bogie conduit means diagonally across the vehicle, each of said diagonal conduit means having a pump means to transfer a fluid suspension medium from one bogie conduit means at one end of said vehicle to the other bogie conduit means at the opposite end of said vehicle, and

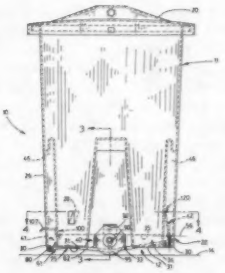
(e) control means for selectively activating said pumps and said valve means in response to said first and said second signals as said vehicle traverses said uneven terrain.

4,420,168

DEVICE FOR HANDLING REFUSE OR THE LIKE MATERIAL

Kenneth M. Dewing, Porterville, Calif., assignor to Terra Bella Industries, Terra Bella, Calif.

Filed Jun. 10, 1982, Ser. No. 386,908
Int. Cl.³ B62B *1/00*
U.S. Cl. 280—43.1 **15 Claims**



1. A device for handling refuse or the like material, the device comprising

A. a container having a bottom surface defining a downwardly open recess therein and having a lowermost area,

B. an arm extending across the surface and having opposite ends,

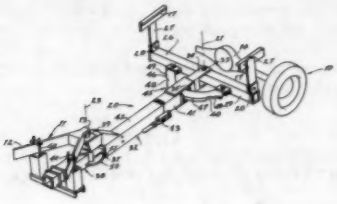
C. means mounting one of the ends on said surface for pivotal movement of the arm before a predetermined upper position and a predetermined lower position,

D. means mounted on the other of the ends selectively for latching the arm to the container when the arm is in the lower position for retention of the arm therein, and

E. a wheel received in the recess and mounted on the arm for movement therewith between said positions, the wheel extending downwardly of the lowermost area when the arm is in the lower position for rolling support of the

container, and the wheel being disposed upwardly of such area in the recess when the arm is in the upper position.

4,420,169
TRAILER HITCH
Wayne A. Taylor, P.O. Box 231, Fairfield, Mont. 59436
Filed Apr. 30, 1982, Ser. No. 373,419
Int. Cl.³ B60D *1/14*
U.S. Cl. 280—446 R **15 Claims**



1. A trailer hitch for attaching a trailer vehicle to a towing vehicle having a rear axle, the hitch comprising:

a hanger frame adapted to be mounted to the towing vehicle adjacent the rear axle thereof;

drawbar means mounted at a forward end to the hanger frame for pivotal movement thereon about a primary axis, and extending to a rear end;

bracket means on the drawbar means at the rear end thereof for free pivotal movement thereon about a secondary axis, mountable to the trailer vehicle;

lockout means interconnecting the hanger frame, drawbar means, and bracket means, for alternately (a) positively locking the drawbar against pivotal motion about one axis while (b) simultaneously allowing pivotal motion about the other axis;

wherein said lockout means includes:

a first cam mounted to the hanger frame having a curved cam surface centered on the primary axis and stops positioned thereon at selected angular positions with respect to the primary axis;

a second cam mounted to the bracket means having a second curved cam surface centered on the secondary axis and a stop positioned thereon at a prescribed angular position with respect to the secondary axis;

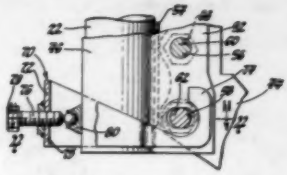
lock pin means slidably mounted to the drawbar and having a forward end for slidably engaging the curved cam surface of the first cam and a rearward end for slidably engaging the curved cam surface of the second cam; and

control means for normally urging the lock pin toward the second cam surface and the stop thereon;

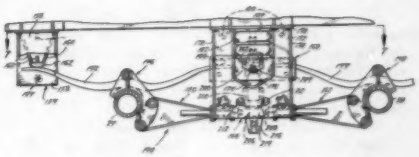
wherein the stop on the second cam and the rearward pin end releasably interlock at a prescribed angular relationship of the bracket means and drawbar means.

4,420,170
CAMBER ADJUSTMENT TOOL AND METHOD FOR STRUT TYPE VEHICLE SUSPENSION
Thomas J. Wysocki, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Sep. 21, 1981, Ser. No. 304,321
Int. Cl.³ B62D *17/00*
U.S. Cl. 280—661 **3 Claims**

1. A tool for adjustment of the camber setting of vehicle strut suspension of the class including a wheel support member and an upstanding hydraulic strut member interconnected by a vertically spaced pair of through-bolt and nut fastener assemblies, a first of such assemblies being received in an overlarge bolt hole means of one of the strut and wheel support members to permit adjustment of the wheel support member relative to the strut about the axis of the other fastener assembly to a selected camber setting of the wheel support member, said tool comprising a U-shaped main member the legs of which are hooked at their ends and of generally equal length and spaced sufficiently apart to straddle the strut and be hooked over the ends of said first fastener assembly, and a set screw device threadably mounted in the web of the main member and including an inner end adapted to bear against said one member, the set screw device being threadable to define and hold various camber settings of the wheel support member relative the strut against forces tending to pull said web of the tool toward the strut.



4,420,171
HEAVY VEHICLE SUSPENSION ASSEMBLY WITH FREE FLOATING SPRINGS AND AXLE STABILIZING TORQUE ROD
John E. Raidel, Rte. 9, Box 400-M, Springfield, Mo. 65804
Division of Ser. No. 196,696, Oct. 14, 1980, Pat. No. 4,371,189.
This application Aug. 6, 1982, Ser. No. 406,023
Int. Cl.³ B60G *11/02*
U.S. Cl. 280—682 **10 Claims**

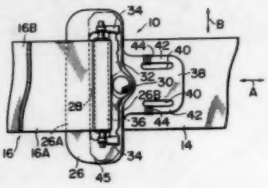


1. A vehicle suspension assembly for supporting a vehicle chassis on at least two vehicle axles comprising a first and second hanger depending downwardly from the chassis, an equalizer, a third hanger depending downwardly from the chassis at approximately the same position as the equalizer, a spring means mounting said equalizer to the third hanger approximately midway between said first and second hangers, said hangers and equalizer being generally aligned longitudinally of the chassis, said spring means permitting limited vertical deflection of the equalizer with respect to the chassis, a shock means extending between the equalizer and the third hanger to dampen the oscillation of the equalizer, a first leaf spring bearing downwardly on the first axle with an end bearing upwardly on the first hanger and an end bearing upwardly on the equalizer, a second leaf spring bearing downwardly on the second axle with an end bearing upwardly on the equalizer and an end bearing upwardly on the second hanger, means to maintain said leaf springs in a load bearing relationship to said axles and permit relative transverse movement therebetween, and means to maintain said equalizer aligned as it deflects vertically with respect to the chassis.

4,420,172
RING JOINT FOR SEATBELT SYSTEM

Ikuzo Kojima, Nagoya, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, both of Aichi, Japan

Filed Nov. 30, 1981, Ser. No. 326,114
Claims priority, application Japan, Jun. 9, 1981, 56-84439[U]
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—802 **16 Claims**



1. A ring joint for connecting an inner webbing and an outer webbing to each other in a seatbelt system for protecting an occupant in a vehicular emergency, comprising:

(a) a ring joint base secured to the forward end portion of the inner webbing and having inserted therethrough an intermediate portion of the outer webbing;

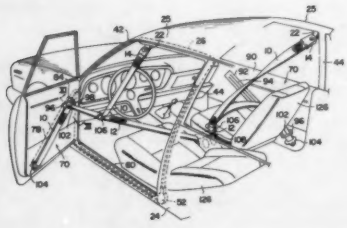
(b) lock means for allowing said base to move relative to the inner webbing in a longitudinal direction of the inner webbing and for interlocking the outer webbing and the base due to said relative movement; and

(c) guide means provided between the base and the inner webbing for allowing relative movement between the base and the inner webbing in the longitudinal direction of the inner webbing, but restricting relative movement between the base and the inner webbing in a widthwise direction of the inner webbing, whereby the inner webbing is prevented from being shifted in the widthwise direction thereof, thereby providing a reliably locked state of the inner webbing.

4,420,173
AUTOMATIC SEATBELT SYSTEM

Shigeru Moriya; Akio Yosida, both of Toyota; Yoshihiro Hayashi, Kasugai; Tatsushi Kubota, Okazaki, and Mitsuaki Katsuno, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, both of Aichi, Japan

Filed Sep. 8, 1981, Ser. No. 300,104
Claims priority, application Japan, Sep. 24, 1980, 55-135707[U]
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—804 **21 Claims**



1. An automatic seatbelt system, comprising:

a first guide rail mounted along a roof side of a vehicle body for guiding a shoulder guide plate;

a second guide rail mounted on a vehicle door for guiding a lap guide plate;

an outer seatbelt having a first end secured to said shoulder guide plate and a second end secured to a lower rear corner of said vehicle door;

an inner seatbelt having a first end slidably connected with an intermediate portion of said outer seatbelt and a second end secured on a takeup shaft of a retractor mounted on a center portion of a vehicle floor;

a ring plate mounted on said lap guide plate and slidably connected with the intermediate portion of said outer seatbelt between said first end of the inner seatbelt and said second end of the outer seatbelt;

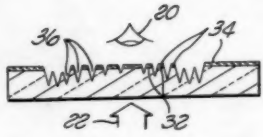
a flexible transmitting means having a first end coupled with said shoulder guide plate and a second end coupled with said lap guide plate; and

a driving means for driving said flexible transmitting means along said first and second guide rails.

4,420,174
IDENTIFICATION CARD BEARING LATENT IMAGE PERCEPTIBLE IN THE PRESENCE OF BACKGROUND LIGHT

Barry C. Phelps, and John S. Hall, both of Sacramento, Calif., assignors to California Interface and Software Limited Partnership, Sacramento, Calif.

Filed Dec. 14, 1981, Ser. No. 330,349
Int. Cl.³ B42D *15/00*
U.S. Cl. 283—75 **12 Claims**



1. A latent image identification card for being viewed in the presence of background light comprising:

a translucent base having a surface with a plurality of depressions engraved therein for defining a plurality of non-engraved regions of varying dimensions between the engraved depressions: and

a substantially opaque layer covering only the non-engraved regions;

such that a negative image appears when the background light passing through the translucent base is less than a determinable value, and a latent, positive, image appears when the background light passing through the translucent base is greater than the determinable value.

4,420,175
COLOR COPY RESISTANT DOCUMENT USING IRREGULAR OUTLINE LETTERS IN A MULTI-VOID BACKGROUND

William H. Mowry, Jr., Ionia, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 22, 1980, Ser. No. 218,506
Int. Cl.³ B42D *15/00*
U.S. Cl. 283—93 **4 Claims**

1. A document for deterring a nefarious reproduction thereof upon a color copier comprising:

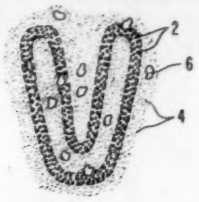
a substrate;

a first tone invalidating image printed in a certain area on said substrate, said invalidating image including at least one outlined character, the outline of said character being at the inner and outer edges of said character, the outlining being a less than full tone image;

a less than full tone colored background printed on the remaining areas of said substrate, said background including the space inside said inner outline edge of said charac-

ter and the space between said inner and outer outline edges;

a second tone camouflage image printed in an overlay fashion over said colored background and said first tone image, wherein said first tone invalidating image formed of



said at least one outlined character is substantially invisible to the human eye when viewed in conjunction with said second tone camouflage image and said background, but which said first one invalidating image formed of said at least one outlined character is readily apparent upon a reproduction of said document by said color copier.

4,420,176

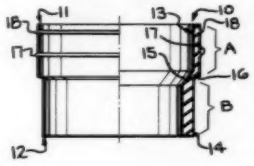
ELASTOMERIC JOINT FOR USE BETWEEN RIGID FITTINGS AND RIGID PIPE AND METHOD OF USE

Kenneth R. Cornwall, 30064 Bentley, Livonia, Mich. 48154

Filed May 27, 1981, Ser. No. 267,636

Int. Cl.³ F16L *5/00*

U.S. Cl. 285—158 **10 Claims**



1. An elastomeric joint adapted for joining rigid pipe to a rigid fitting having a cylindrical opening and inner surface adapted for sealing engagement with an outside portion of the rigid pipe and the pipe fitting having an annular ring projecting from the inner surface for abutting with an end of the rigid pipe which comprises:

an integral tubular elastomeric joint with two spaced apart ends perpendicular to and around a longitudinal axis and having a larger diameter section and a smaller diameter section along the axis between the ends with inside and outside surfaces on each section defining walls and with spaced apart annular shoulders on the inside and outside surfaces of the joint intermediate the sections,

wherein the outside surface of the smaller section of the joint is cylindrical and adapted to be sealed with the inner surface of the rigid fitting with the end of the smaller section abutting on the annular ring of the rigid fitting and with the outside shoulder abutting on a lip of the opening of the rigid fitting, and

wherein the larger section of the joint has a cylindrical inside surface for sealing with an outside portion of the rigid pipe so that the pipe is separated by the joint from the rigid fitting and so that the larger section of the joint can be clamped to the pipe by a locking means, wherein the wall thickness of the larger section is such that, with the smaller section inserted in the rigid fitting opening prior to attachment to the pipe, the larger section can be flexed outward and over the outside surface of the fitting or inward inside the opening of the rigid fitting.

4,420,177

KNOTTERS

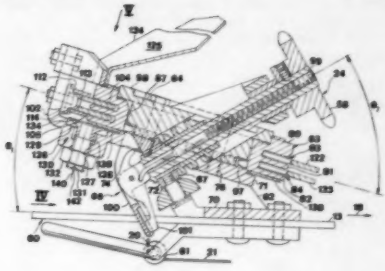
James A. Munro, Aylesbury, England, and Marc G. Vansteelant, Zedelgem, Belgium, assignors to Sperry Corporation, New Holland, Pa.

Filed Jun. 20, 1980, Ser. No. 161,632

Claims priority, application United Kingdom, Jun. 22, 1979, 7921878

Int. Cl.³ B65H *69/04*

U.S. Cl. 289—14 **9 Claims**



1. In a knotter apparatus, the combination comprising:

a twine holder including a plurality of rotating twine discs;

a shear plate connected to rotate with said twine discs; and

a knife rotatably connected to said twine holder having a cutting edge in knife-sharpening engagement with said shear plate.

4,420,178

REMOVABLE FIXING DEVICE

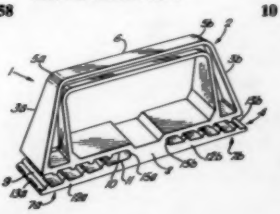
Gerald M. Taylor, Harpenden, and Norman R. Emms, Welwyn Garden City, both of England, assignors to Item Products Limited, London, England

Filed Nov. 6, 1981, Ser. No. 318,864

Claims priority, application United Kingdom, Nov. 10, 1980, 8036056

Int. Cl.³ B65D *71/00*

U.S. Cl. 294—158 **10 Claims**



1. A removable carrying handle for use with an article having a slot, comprising:

a plurality of outwardly projecting clips, each clip comprising an upper interior surface and a lower interior surface and;

handle means to enable twisting of the clips;

the device being so constructed that it may be fastened to the article by positioning the device with each said clip generally aligned with and between opposed slot edges and by then twisting the clip by means of the handle means so as to permit substantial portions of the upper and lower interior surfaces of each clip to receive and grip therein opposed slot-defining edge portions of the article.

4,420,179
RAILWAY CAR WHEEL

Hans-Martin Brauer, Mögglingen, Fed. Rep. of Germany, assignor to Schwäbische Hüttenwerke Gesellschaft mit beschränkter Haftung, Aalen-Wasseralfingen, Fed. Rep. of Germany

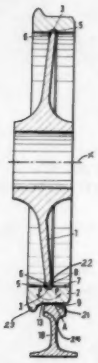
Continuation-in-part of Ser. No. 950,591, Oct. 12, 1978, Pat. No. 4,318,564. This application Aug. 7, 1981, Ser. No. 291,103

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1977, 2746407

The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.

Int. Cl.³ B60B *3/04, 9/12, 17/00, 21/00*

U.S. Cl. 295—15 5 Claims



1. A wheel used in a wheel set mounted on an axle for use with vehicles which ride on pairs of rails, the wheel comprising:

a wheel disc having an annular web portion and hub portion integral with the web portion, wherein the hub portion is centrally disposed in the wheel disc for concentric attachment of the wheel disc to the axle and wherein the web portion has an outer periphery which is curved about a line circumferential with respect to the disc, the web portion being concave and substantially thinner in cross-section than the hub portion;

a metal tire surrounding the wheel disc, the metal tire having a circular tread surface for engaging the rail, a circular interior surface for juxtaposition with the wheel disc, a first radial surface and a second radial surface, wherein the exterior surface joins the second radial surface to form a large diameter wheel flange and converges toward the first radial surface, and wherein the interior surface has portions of lesser diameter and greater diameter, one of which is curved to form a bearing surface which complements the curved bearing surface on web portion of the wheel disc and;

a bearing material on one of the bearing surfaces, whereby as the vehicle rolls along the rails and the wheel moves axially to engage and disengage the wheel flange with the rail, the tire oscillates with respect to the wheel disc about an axis extending normally with respect to the rail and hub.

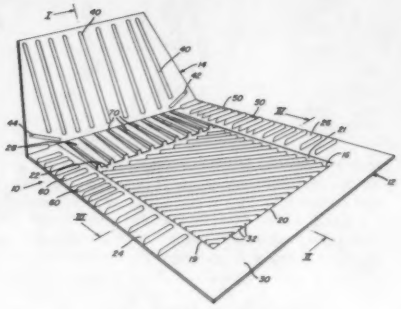
4,420,180
AUTOMOBILE FLOOR MAT WITH MOISTURE COLLECTING FEATURE

Andre' Dupont, Longueuil; Paul Laurent, Boucherville, and Bernard Beaujardin, Montreal, all of Canada, assignors to Creations 2000, Inc., Longueuil, Canada

Filed Feb. 11, 1982, Ser. No. 347,915

Int. Cl.³ B60N *3/04*

U.S. Cl. 296—1 F 5 Claims



1. An automobile floor mat comprising:

a main portion for lying flat on an automobile floor, said main portion comprising a centrally disposed, downwardly recessed area forming a pan for catching fluid, said pan having a floor and surrounding sides; a plurality of ridges rising vertically from said pan floor for holding clothing above said floor; and

an inclined forward portion extending in the longitudinal direction of said mat for lying on an inclined surface of said automobile, for example, the surface behind the pedals of the automobile; a plurality of ribs being formed on said inclined forward portion, said ribs extending along said pan,

wherein each of said ridges has a generally triangular upper portion with the apex of each ridge pointing upwardly and the base of each ridge being connected to said pan floor.

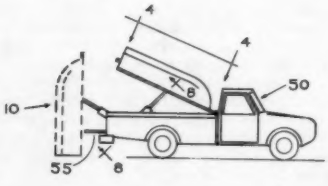
4,420,181
BOAT-CANOPY FOR TRUCK BEDS

Wayne A. Hallburg, 1412 Sandhagen, Port Angeles, Wash. 98362

Filed Jun. 4, 1981, Ser. No. 270,645

Int. Cl.³ B60P *7/02, 3/10;* B63B *7/02*

U.S. Cl. 296—157 7 Claims



1. A boat-canopy enclosure for the bed of a pickup truck and the like, which comprises:

a rectangular boat structure adapted to enclose a truck bed including a bottom portion of spaced twin hulls and a covering floor secured to the top edges thereof, a top portion having spaced upwardly extending sides longitudinally connected along the floor boundary, the sides and said floor being extended forwardly to merge together

into a square ended bow, and an upright panel enclosing the rear end of said floor and top portion of the structure,

a deck strip connected to the upper edge of said sides and bow adapted to rest on and secured to the side walls of the truck bed,

an elongated L-shape member having a vertical flange connected to the side wall behind said truck cab such that the horizontal flange extends above the top of said wall to provide a space there between for receiving a portion of the bow deck strip when said structure rests on said truck walls,

a pair of extensible cylinders having one end pivotally connected to said top portion and the other to said truck bed, the cylinders being adapted to apply upward pressure on said structure, and

a latching device detachably mounted on the rear wall of said truck bed and upright panel for securing said structure on said bed.

4,420,182

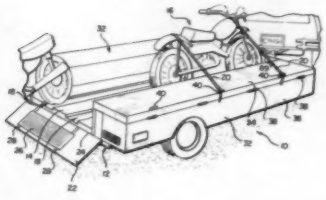
COLLAPSIBLE TRAILER

Edward S. Kaneshiro, 452 Harbor Ter., Bartlett, Ill. 60103

Filed Nov. 13, 1981, Ser. No. 321,127

Int. Cl.³ B60P *3/32*

U.S. Cl. 296—158 **7 Claims**



1. A camping trailer which is collapsible from an opened position to a collapsed storage position comprising:

a substantially rectangular trailer frame having a length and width;

a horizontal camper floor connected to the frame, the camper floor having two camper floor sides parallel to the length, and front and back sides parallel to the width;

two pairs of channels in the camper floor, each pair parallel to the other and parallel to the camper floor sides;

a substantially rectangular rigid top panel having two side edges and front and back edges, the two side edges parallel to the two sides of the camper floor, and the front and back edges parallel to the front and back sides of the camper floor;

a rigid front panel with a top edge pivotally affixed to the front edge of the top panel, the rigid front panel having bottom tracking means slidably received by one pair of the channels;

support means pivotally affixed to the back edge of the top panel and having a rigid back panel secured thereto, the support means also having a second bottom tracking means slidably received by the second pair of channels;

the rigid front panel is collapsible from an opened upright position to a collapsed horizontal storage position above the camper floor;

the support means and rigid back panel secured thereto are collapsible from an opened upright position to a collapsed substantially horizontal storage position above the camper floor;

the rigid top panel is collapsible from an opened horizontal position to a collapsed horizontal storage position above the collapsed rigid front and back panels;

the tracking means sliding within the two pairs of channels during the collapsing and opening of the top panel, and the top panel functioning as a ceiling or roof when the trailer is in the opened position and functioning as a flat storage bed in the collapsed position

whereby the top panel, rigid front panel and rigid back panel are stacked adjacent each other in the collapsed position.

4,420,183

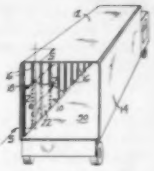
BODY LINER ASSEMBLY

Robert C. Sherman, 32 Waterside La., Clinton, Conn. 06413

Continuation-in-part of Ser. No. 288,977, Jul. 31, 1981. This application Jul. 2, 1982, Ser. No. 393,593

Int. Cl.³ B62D *33/04*

U.S. Cl. 296—181 **13 Claims**



1. In a cargo transport container body having an outer shell with vertical side walls and a plurality of spaced-apart vertical interior support posts, a body liner assembly comprising

a plurality of liner sheet elements each having top, middle and bottom portions, and inner and outer surfaces with said inner surface being smooth to face the interior of the container body, each said liner element having a normally arcuate profile between said top and bottom portions,

first means for detachably clamping said bottom portion of said liner elements against said support posts, and

second means for detachably clamping said top portion of said liner elements against said support posts and for allowing vertical expansion and contraction of said liner elements, said arcuate profile of each liner element causing said top and bottom portions of said liner element to bias inwardly toward the interior of the container body against said first and second clamping means respectively and said middle portion to bias outwardly toward said support posts,

said plurality of liner elements being mounted in adjoining disposition to form a smooth continuous interior wall surface.

4,420,184

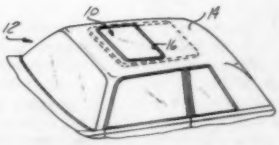
PIVOTAL-SLIDING ROOF PANEL APPARATUS

Milton C. Kaltz, Allen Park, Mich., assignor to American Sunroof Corporation, Southgate, Mich.

Filed Dec. 4, 1981, Ser. No. 327,356

Int. Cl.³ B60J *7/00*

U.S. Cl. 296—221 **10 Claims**



1. A pivotal-sliding roof panel apparatus adapted to be mounted to the stationary roof structure of a vehicle having an opening in the roof thereof which is opened and closed by a movable roof panel, the apparatus comprising:

a housing adapted to be mounted to the stationary roof

structure of the vehicle, the housing having an aperture alignable with the opening in the roof of the vehicle;

a roof panel movably mounted within the housing;

drive means, mounted on the housing and operably connected to the movable roof panel, for causing selective movement of the movable roof panel;

guide rails mounted on the housing and extending in the sliding direction of the movable roof panel;

first and second lifter means, connected between the housing and opposed sides of the movable roof panel for raising and lowering the movable roof panel, the first and second lifter means each comprising:

first and second pivotally connected links movable between collapsed and extended positions;

guide means slidably disposed within the guide rails, the guide means connected to and moved by the drive means;

a slider member slidably disposed within the guide means;

the first link pivotally connected at a first end to an intermediate portion of the second link and at a second end to the slider member;

the second link pivotally connected at a first end to the guide means and at a second end to the movable roof panel; and

stop means for stopping the forward movement of the first link such that the lifter means moves to a partially-extended position from the collapsed position raising the roof panel to a closed position and, upon continued movement of the drive means, to a fully-extended position raising the roof panel to a partially-opened venting position.

4,420,185

DRIVE ARRANGEMENT FOR A MOTOR-VEHICLE TOP WITH OUTWARD-MOVING SLIDING COVER

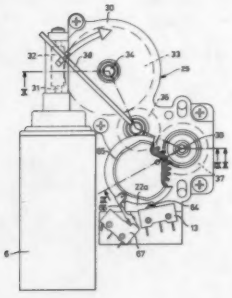
Horst Bienert, Gauting, and Hermann Pfisterer, Stockdorf, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Munich, Fed. Rep. of Germany

Filed Aug. 7, 1981, Ser. No. 291,055

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030642

Int. Cl.[3] **G05D** *3/00;* **H02P** *1/04, 3/00;* **B60J** *7/02*

U.S. Cl. 296—223 **11 Claims**



1. A drive arrangement for a motor-vehicle top having an outwardly movable sliding cover driven by an electric motor through a transmission and at least one threaded cable engaging a pinion of the transmission, a manually-actuated switch and a limit switch with a contact arm being provided in a circuit of the electric motor, said contact arm cooperating with a cam of a trip gear to interrupt the current supply to the electric motor in a closed position of the sliding cover, and teeth of said trip gear forming with an indexing gear driven by the pinion shaft a step-by-step indexing transmission whose transmission ratio is determined so that the trip gear rotates by a maximum angle of 360° as the sliding cover moves from a fully retracted position to the closed position and an upwardly fully extended position; characterized in that the step-by-step indexing transmission is provided with transmission elements for performing at least one of extending the length of an indexing step conducted near the closed position of the sliding cover and reducing the angular velocity of the trip gear during said indexing step.

4,420,186

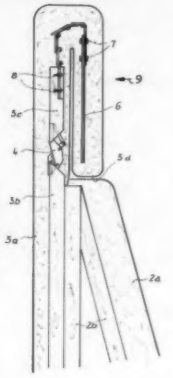
CONVERTIBLE LOW-BACK, HIGH-BACK UPHOLSTERED FURNITURE

Wilhelm Vogt, Bielefeld, Fed. Rep. of Germany, assignor to Hans Kaufeld GmbH & Co., Bielefeld, Fed. Rep. of Germany

Continuation of Ser. No. 54,076, Jul. 2, 1979, abandoned. This application Jun. 8, 1981, Ser. No. 271,307

Int. Cl.[3] **A47C** *3/00, 17/00*

U.S. Cl. 297—284 **7 Claims**



1. An article of upholstered furniture adapted to be sat upon and comprising a substantially horizontal padded seat and a substantially vertical padded back rest attached thereto, a padded cushion attached to said padded back rest, said cushion comprising a first portion which overlies the rear surface of said back rest and has a generally vertically extending insert embedded therein, said padded cushion further comprising a second cushion portion having an elongated, unidirectionally flexible element embedded therein, hinge means connecting one end of said unidirectionally flexible element to one end of said insert at a position adjacent the uppermost edge of said back rest, said second cushion portion, said unidirectionally flexible element, and said hinge means being adapted to be manipulated into a first position wherein said second cushion portion overlies the forward padded surface of said back rest with a free edge of said second cushion portion being disposed closely adjacent to said padded seat whereby said article of furniture is adapted to be sat upon in a low-back furniture configuration, and being adapted to be manipulated into a second position wherein said second cushion portion is folded upon itself and extends upwardly from and vertically above said padded back rest with the said free edge of said second cushion portion resting upon the uppermost edge of said padded back rest to provide a padded head rest which is disposed immediately above said padded back rest whereby said article of furniture is adapted to be sat upon in a high-back furniture configuration, said embedded unidirectionally flexible element being constructed to exhibit flexibility in a single direction only relative to a predetermined limiting orientation which is defined by the said second position of said second cushion portion, whereby said unidirectionally flexible element is adapted to assume a plurality of different curvatures within said padded cushion as said second cushion portion is manipulated from said first position into said second position, or vice versa, relative to said padded back rest but said limiting orientation of said embedded unidirectionally flexible element inhibits rear-

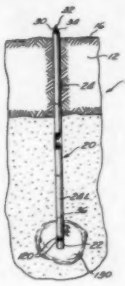
ward displacement of said second cushion portion relative to said padded back rest when said second cushion portion is in its said second position.

4,420,187

STATIONARY DRILL STRING ROTARY HYDRAULIC MINING TOOL AND METHOD OF HYDRAULIC MINING

Everett L. Hodges, 49 Royal St. George, Newport Beach, Calif. 92660

Filed Apr. 13, 1981, Ser. No. 253,681
Int. Cl.³ E21C *45/00*
U.S. Cl. 299—17 **9 Claims**



1. An improved method of hydraulically mining a subterranean mineral formation comprising the steps of:

inserting a hydraulic mining tool apparatus into said formations from ground surface, said apparatus including a drill string and a mining tool mounted for independent axial rotation on one end of said drill string;

axially rotating said mining tool while maintaining said drill string stationary within said formation to isolate frictional drag forces from said drill string;

introducing a hydraulic mining fluid outward from said mining tool to dislodge minerals from said formation and form a resultant mineral slurry; and

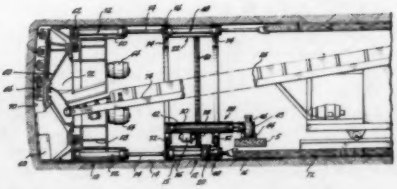
transporting said mineral slurry from said formation to said ground surface through the interior of said mining tool and drill string.

4,420,188

DOUBLE SHIELD TUNNEL BORING MACHINE

Richard J. Robbins, and David T. Cass, both of Seattle, Wash., assignors to The Robbins Company, Kent, Wash.

Continuation-in-part of Ser. No. 802,878, Jun. 2, 1977, abandoned, which is a continuation of Ser. No. 677,709, Apr. 16, 1976, abandoned, which is a continuation of Ser. No. 481,292, Jun. 20, 1974, abandoned. This application Nov. 27, 1981, Ser. No. 325,101
Int. Cl.³ E21D *9/08*
U.S. Cl. 299—31 **19 Claims**



1. A tunneling machine comprising:

front and rear ground supporting tubular shields, each having a ground contacting outer surface, with at least a substantial portion of the front shield always being positioned forwardly of said rear shield, and with at least a substantial portion of the rear shield always being positioned rearwardly of said front shield;

radially expandible-contractable gripper means on said rear shield, operable for gripping the tunnel wall to in that manner anchor the rear shield against at least axial movement relative to the tunnel wall;

said rear shield having a tail section comprising tubular wall means which extend axially rearwardly from said gripper means, and providing a space under cover of said tubular wall means within which a tunnel lining is constructed;

thrust ram means comprising a first ring of axially extending linear hydraulic motors interconnected between the front and rear shields, adjacent the peripheries thereof, means for selectively delivering hydraulic fluid into said thrust ram means so that said thrust ram means are operable for shoving the front shield axially forwardly relative to the rear shield while the rear shield is anchored in position by the gripper means, and for turning said front shield in the tunnel relative to the rear shield to in this manner change the direction of advance of the tunneling machine;

a second ring of axially extending linear hydraulic motors each having piston and cylinder portions, a first one of said portions being mounted on said rear shield and the second one of said portions being extendible rearwardly from said first portion and the rear shield to contact and push against a tunnel lining within the tail section space;

power earth cutting means on said front shield, for cutting material from the tunnel face during forward movement of the front shield; and

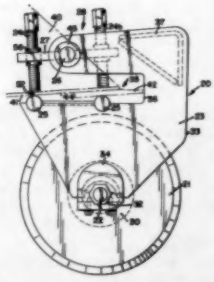
power conveyor means extending from said power earth cutter means rearwardly through said front and rear shield, for removing cuttings from the tunnel face.

4,420,189

APPARATUS FOR ATTACHING TO EARTH WORKING EQUIPMENT

Dennis von Ruden, Owatonna, Minn., assignor to General Equipment Co., Owatonna, Minn.

Filed May 11, 1981, Ser. No. 262,454
Int. Cl.³ E01C *23/09*
U.S. Cl. 299—40 **8 Claims**



1. An apparatus for attachment to earth working equipment, comprising:

(a) a tool;

(b) means for supporting said tool; and

(c) means for attaching said support means to a wall mounted on said earth working equipment, said (attaching) attachment means including means for contacting a first surface of said wall and a pair of counter-threaded screws for forcing a second surface of said wall to frictionally retain and clamp said support means in a stationary position relative thereto whereby a force tending to

loosen a first threaded screw of said pair simultaneously tightens a second counter-threaded screw of said pair thereby keeping said apparatus attached tightly to said wall.

4,420,190
CAST VEHICLE WHEEL

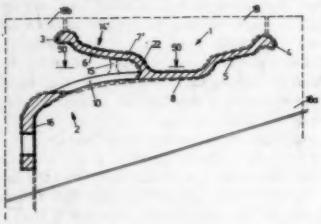
Jakob Rohr, Schaffhausen, Switzerland, assignor to George Fischer Ltd., Switzerland

Filed Nov. 6, 1981, Ser. No. 318,941

Claims priority, application Switzerland, Nov. 13, 1980, 8420/80

Int. Cl.³ B60B *3/06*

U.S. Cl. 301—63 R **8 Claims**



1. An improved cast vehicle wheel, particularly for use with tubeless tires, of the type having the unitarily formed combination of a rim portion, an axially offset pan and a flat annular flange, wherein the rim portion has a drop-center portion with conical surface portions extending outwardly from both sides thereof and with a shoulder formed between the drop-center portion and one of the conical portions, and wherein the pan interconnects the flat annular flange and the rim portion and includes means defining hand-holes therethrough, the improvement wherein

the shoulder is formed between the drop-center portion and the one conical portion on the same side as the axially offset pan and flange,

intermediate portions of the pan between said hand-holes are shaped to merge into the rim portion, and

an annular wall portion extends generally radially about the wheel axis and connects the shoulder with the drop-center portion and the intermediate portions of the pan, the wall portion undulating in directions substantially parallel to the wheel axis.

4,420,191
SKID CONTROL SYSTEM

Tetsuro Arikawa, and Teruo Inoue, both of Yokosuka, Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

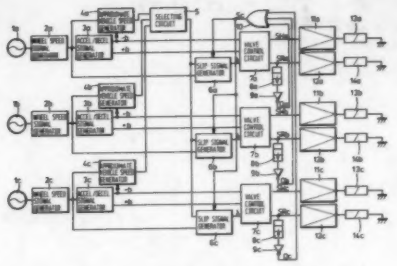
Filed Apr. 3, 1981, Ser. No. 250,877

Claims priority, application Japan, Apr. 7, 1980, 55-45523; Jul. 26, 1980, 55-102678; Aug. 8, 1980, 55-109549

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—103 **14 Claims**

1. In a skid control system for a vehicle having two or more wheels and the respective brakes for the wheels, including two or more skid control circuits, each of which comprises a wheel speed sensor for providing an output signal representative of the speed of said wheel or the mean speed of said wheels, an approximate vehicle speed generator for providing an output signal representative of the approximate speed of the vehicle on the basis of said output signal of the wheel speed sensor, a slip signal generator receiving said output signal of the wheel speed sensor, an acceleration/deceleration signal generator receiving said output signal of the wheel speed sensor, a valve control circuit receiving the outputs of said slip signal generator and acceleration/deceleration signal generator, and electromagnetic valve means receiving the output of said valve control circuit, wherein the maximum of the outputs of said approximate vehicle speed generators of the skid control circuits is supplied to the respective slip signal generators, a predetermined amount is set in said respective slip signal generators, and a slip signal for relieving the brake to the wheel is generated from said slip signal generator, when the speed of the corresponding wheel becomes lower by more than said predetermined amount than said maximum of the output of the approximate vehicle speed generators, the improvement in which a second predetermined amount is set in said respective



slip signal generators, said slip signal generator generating a second slip signal, when the speed of the corresponding wheel becomes lower by more than said second predetermined amount than said maximum output of the approximate vehicle speed generators, and the larger of said first-mentioned predetermined amount and said second predetermined amount is selected in said slip signal generator of any one of said skid control circuits, until a skid signal or skid signals representative of the skid condition of the wheel or wheels is generated in the other of said skid control circuits.

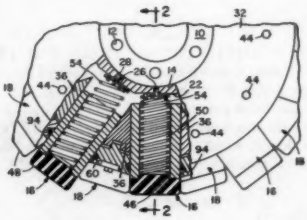
4,420,192
WALKING WHEEL

Leonard J. Holchuk, 2053 Lake St., Elmira, N.Y. 14901

Filed May 26, 1981, Ser. No. 266,755

Int. Cl.³ B60B *15/18*; **B60C** *7/00*

U.S. Cl. 305—5 **8 Claims**



1. In a vehicle wheel of the type comprising

a hub,

means defining a plurality of chambers equally spaced around said hub,

a foot disposed in each of said chambers and being capable of radial movement,

means for restricting movement of each of said feet beyond a predetermined distance from said hub so that those portions of said feet remote from said hub tend to lie in a substantially circular arc, and

at least one spring disposed between each foot and said hub, one end of each spring being disposed within said foot and forcing it outwardly,

characterized in that

each of said chambers comprises two opposed planar side walls, the front and rear chamber walls comprising triangularly-shaped members, a planar surface of each triangularly-shaped member being contiguous with a wall of an adjacent foot, and

in that said movement-restricting means comprises

a locking slot in a side wall of each foot, said locking slot having an end wall,

a plate bolted to said wheel and extending into said locking slot, and

a locking member situated on the outer surface of each triangularly-shaped member, said plate being situated in a locking plate slot in the outer surface of said locking member.

4,420,193

LINEAR BALL BEARING UNIT

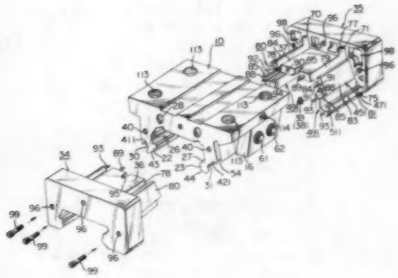
Hiroshi Teramachi, 34-8, Higashi-Tamagawa 2-chome, Setagaya-ku, Tokyo, Japan (158)

Filed Jul. 19, 1982, Ser. No. 399,917

Claims priority, application Japan, Aug. 11, 1981, 56-124821; Sep. 17, 1981, 56-137076[U]

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **5 Claims**



1. A linear ball bearing assembly comprising:

(a) a linear ball bearing with opposite ends including a bearing block body and retaining covers attached to said opposite ends;

(b) a race bar of generally X-shaped cross section with ribs, and a central recess of a generally trapezoidal cross section defined in said bearing block body, said central recess having an upper wall, also inclined walls with lower hook-shaped supporting parts, and right and left skirts formed on opposite sides of said central recess, four axial grooves for receiving loaded balls defined in said upper wall and said lower hook-shaped supporting parts of said inclined walls, the radius of curvature of said grooves being substantially the same as the radius of balls which are to be received, also, axial through holes for receiving unloaded balls, defined in parallel to said grooves for receiving loaded balls, said axial holes being so disposed as to also define a junction between said holes and said grooves for receiving loaded balls;

(c) grooves for receiving unloaded balls defined in the back side surfaces of said lower hook-shaped supporting parts, in parallel to said grooves for receiving loaded balls, also, a junction being defined between said grooves for receiving loaded balls and said grooves for receiving unloaded balls;

(d) U-shaped grooves for inverting the direction of movement of balls defined in each of said retaining covers at positions corresponding to the junction between the grooves for receiving loaded balls and the holes for receiving unloaded balls and, between the grooves for receiving loaded balls and the grooves for receiving unloaded balls;

(e) each of said retaining side covers integrally including a horizontal member, right and left inclined members and right and left receiving members which extend on the respective sides of said U-shaped grooves for inverting the direction of movement of the balls;

(f) grooves providing a path for loaded balls of a radius of curvature substantially the same as the radius of any balls in said path and of a size capable of retaining any such balls defined between said horizontal member, right and left inclined members and right and left receiving members, along the axial direction of said members, said retaining covers being disposed in said bearing block body at the opposite ends thereof and fixed thereto with said horizontal members firmly fastened to the upper wall of said bearing block body, each of said right and left receiving members being formed in a substantially U-shaped cross section with an upper inverted L-shaped part with an upper edge, said upper edge being disposed opposite the groove for receiving unloaded balls and is provided with a guide groove;

(g) a multiplicity of balls filled in all said grooves and holes defined in said bearing block body and in said retaining covers, said race bar of generally X-shaped cross section being provided with grooves of a radius of curvature substantially the same as the radius of the balls which are to be inserted so as to receive loaded balls in the upper surfaces and in the lower inclined surfaces of the right and left ribs thereof.

4,420,194

BALL SLIDEWAY

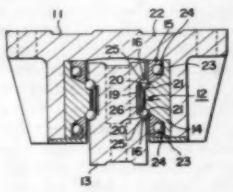
Kanji Asami, Hino, Japan, assignor to Hephaist Seiko Co., Saitama, Japan

Filed Jul. 14, 1981, Ser. No. 283,348

Claims priority, application Japan, Jul. 21, 1980, 55-99713

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **1 Claim**



1. A ball slideway, comprising:

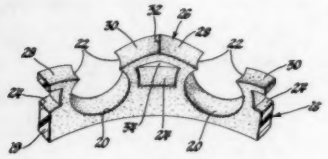
(a) a central guide member having a recess therein formed by sloping sides and a pair of first substantially parallel elongated ball grooves, each ball groove formed in a sloping side, and each ball groove being a first distance apart from the other groove;

(b) a plurality of balls;

(c) a bracket member pressed against and partially surrounding the guide member for linear movement with respect thereto, the bracket member including a portion thereof projecting toward the recess of the guide member, the projecting portion having a pair of second elongated ball grooves adjacent the first pair of ball grooves and substantially parallel thereto, the distance between each of the second ball grooves being less than the distance between each of the first ball grooves, and said first and second ball grooves being formed so that respective lines of force acting on the balls and passing through the middle of each of the first ball grooves and each of the corresponding second ball grooves intersect outside the guide member; and

(d) ball retainer means mounted between the guide and bracket members for defining a pair of independent, continuous ball circulating paths to retain the balls and permit them to circulate when the bracket member is moved linearly with respect to the guide member, and wherein the plane of one of the ball circulating paths is skew to the plane of the other ball circulating path.

4,420,195
BALL BEARING RETAINER
Eugene W. Christen, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Sep. 18, 1981, Ser. No. 303,358
Int. Cl.³ F16C *33/38*
U.S. Cl. 308—201 **1 Claim**



1. A ball bearing retainer for the retention and guiding separation of bearing balls during bearing assembly, comprising,

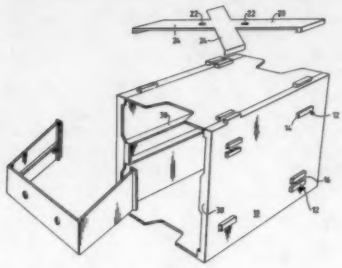
an annular body portion having a plurality of spherically concave ball retention pockets, each retention pocket opening axially outwardly of the body portion and including a pair of flexible retention lips, the retention lips disposed in a common radial plane of the body portion, each of said lips having a radially extending edge portion

a ball separation and guidance projection spanning each pair of adjacent retention pockets to leave a closed radial opening therebetween, said radial opening being located between said projection and said body portion, each projection including a pair of sloped walls, each sloping from an integral apex located axially outwardly of the plane of the retention lips to the said radial edge portion of a respective retention lip of an adjacent ball pocket and being integral therewith, the walls providing separation and guidance of the bearing balls toward the retention pockets during bearing assembly,

the radial opening between the body portion and each projection allowing the sloped walls to flex axially of the body portion with the retention lips about the apex as the bearing balls enter the ball retention pockets.

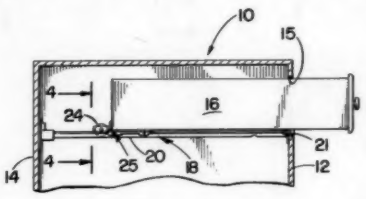
4,420,196
ROTARY FILING DEVICE
John M. Fuller, Hawkell House, Fireball Hill, Sunningdale, Berkshire, England
Filed Jun. 12, 1981, Ser. No. 272,931
Int. Cl.³ A47B *63/00, 81/06*
U.S. Cl. 312—186 **10 Claims**

1. A rotary filing device comprising a frame carrying mounting strips each adapted to receive a container for an item or items to be stored, all of the strips being supported at each end in a common elongate recess and the strips themselves being linked together to form an endless chain which is movable



within said recess by tilting successive strips to provide access to each container in turn.

4,420,197
GUIDE MEANS FOR SLIDING DRAWERS
Sebastian E. Dreiling, 2040 Conejo La., Fullerton, Calif. 92633
Filed May 1, 1981, Ser. No. 259,412
Int. Cl.³ A47B *88/00*; F16C *21/00*
U.S. Cl. 312—330 R **1 Claim**



1. An improved guide means for sliding drawers, comprising:

an elongated track defined by a channel having a pair of oppositely disposed longitudinal edge flanges and a longitudinal recess formed in the bottom of said channel, said recess being defined by a pair of spaced-apart longitudinal rib members projecting upwardly from said bottom of said channel;

a carriage having a substantially rectangular frame structure having a transverse brace member, whereby said frame structure is secured to the bottom of said drawer and said brace member is secured to the rear of said drawer, said frame structure including oppositely disposed depending side walls;

a roller mounted rearwardly of said carriage and said drawer, and adapted to be received in said recess of said track between said longitudinal rib members to provide lateral stability to the sliding drawer, said roller being supported in a rearwardly extended bracket integrally formed with said frame structure;

stop means formed in said track and positioned to be engaged by said roller, said stop means comprising a raised ramp formed in said bottom of said track adjacent the forward end of said track;

restraint means comprising a pair of inwardly projecting shoe members integrally formed below said frame structure so as to be positioned below said flanges of said track, whereby said flanges pass through said carriage without engaging said frame structure or shoe members, until said drawer is to be removed from said track and said roller engages said raised ramp; and

alignment means comprising at least one pair of guide-rib projections formed on each inner side of said depending side walls of said frame structure, whereby said oppositely disposed projections are arranged to engage the longitudinal edges of said respective flange members of said track.

4,420,198

ELECTRICAL CONNECTION

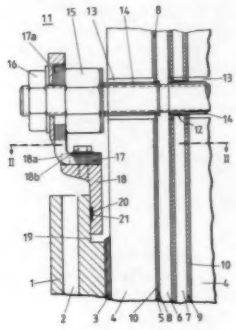
Willibald Zerlik, Birr, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jun. 25, 1981, Ser. No. 277,239

Claims priority, application European Pat. Off., Jul. 4, 1980, 80200649.4

Int. Cl.³ H01R *39/08, 39/24*

U.S. Cl. 339—5 R **2 Claims**



1. An electrical connection for a electrical machine having a gas cooled rotor comprising:

a slip ring;

a first and second contact rail;

a rotor shaft mounted in an axial shaft borehole formed in said electrical machine;

a slip ring bolt mounted in a radial shaft borehole formed in said electrical machine so as to have axial play and connected at a first end thereof to at least one of said first and second contact rails; and

an electrical connecting link interconnecting a second end of said slip ring bolt to said slip ring wherein said electrical connecting link comprises a ring-shape contact carrier surrounding said rotor shaft and rigidly connected to said slip ring bolt; and a contact lamination tape disposed between said slip ring and said contact carrier wherein said slip ring has an axially extending annulus formed therein, said contact carrier axially extending into said annulus of said slip ring, and said contact carrier having an annular slot formed therein to receive said contact lamination tape in a substantially center section portion of the end portion on the contact carrier which extends into said annulus, and wherein the outer circumference of an end portion of said contact carrier contacts the circumference of said annulus formed in said slip ring, and the axial dimension of said contact lamination tape is less than the axial dimension of the depth of the extension of said contact carrier into said annulus.

4,420,199

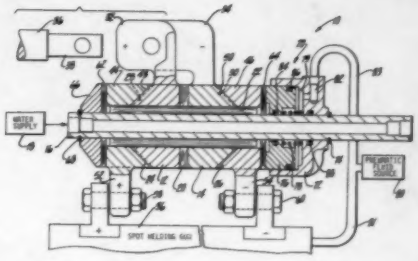
CABLE CONNECTOR

Arthur D. Vis, Warren, and Karl Sarafian, Lathrup Village, both of Mich., assignors to Craft Line Inc., Hazel Park, Mich.

Filed Oct. 30, 1981, Ser. No. 316,622

Int. Cl.³ H01R *39/10*

U.S. Cl. 339—8 R **12 Claims**



1. In a rotary joint cable connector, the improvement comprising:

at least two electrically conductive members having opposing contact surfaces normally held in wiping engagement with each other; and

actuator means coupled to said members for selectively forcing the contact surfaces into highly pressurized locking engagement during application of current through the cable.

4,420,200

SURGE-PROTECTED CABLE JOINT

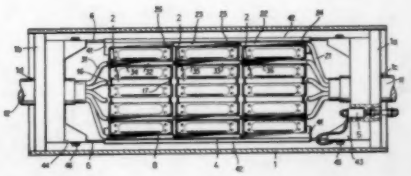
Horst Forberg; Wolfgang Radelow; Klaus-Peter Achtnig, and Manfred Müller, all of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,725

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1980, 8021913[U]

Int. Cl.³ H01R *13/648*

U.S. Cl. 339—13 **2 Claims**



1. A surge-protected cable joint for telecommunication networks, comprising a joint casing closed at either end and having axial cable inlets, and terminal strips secured in the joint interior for the cable wires, characterized in

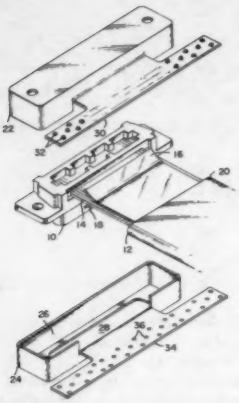
that within the joint interior a plurality of rows of terminal strips (3) is provided on both sides of a central longitudinal plane so as to extend longitudinally in series, that each row of terminal strips (3) is secured within a receiving trough (2, 2a), and that pairs of the receiving troughs (2, 2a) are secured with their bottoms facing each other and to lateral connecting rails (4), said connecting rails (4) being mechanically and electrically coupled by means of support rails (6) to the two sealing end plates of the joint casing.

4,420,201

SHIELDING ASSEMBLY ENCLOSING AN ELECTRICAL CONNECTOR TERMINATING SHIELDED CABLE

Brian D. Stephenson, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 9, 1981, Ser. No. 319,347
Int. Cl.³ H01R *13/648*
U.S. Cl. 339—14 R **7 Claims**



1. A shielding assembly for fully enclosing an electrical connector and terminating shielding layers of a fully shielded cable, said shielding assembly comprising:

a pair of seamless formed mating metal housing members together defining a full enclosure for an electrical connector,

one of said housing members defining an aperture providing access to a mating face of said electrical connector,

each said housing member having an integral T-shaped extension with a plurality of flanged apertures formed in a cross bar portion thereof, said apertures being slightly offset with respect to each other in a superimposed condition,

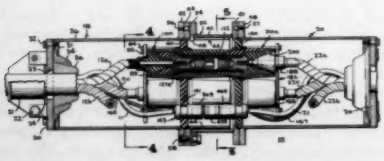
whereby crimping end portions of said cross bar upon itself causes said flanged apertures to penetrate a shielding layer from opposite sides forming a sandwich with flanges of one side engaging apertures of the other side and vice versa.

4,420,202

PLURAL PHASE CABLE COUPLERS

Namik O. Atakkaan, Bluefield, W. Va., assignor to Pemco Corporation, Bluefield, W. Va.

Filed Sep. 10, 1981, Ser. No. 301,149
Int. Cl.³ H01R *4/66*
U.S. Cl. 339—14 R **6 Claims**



1. A cable coupler assembly for interconnecting a first plurality of plural phase, high voltage cables with a second plurality of plural phase, high voltage cables, said coupler assembly comprising:

(a) a first plurality of female terminals for attachment to corresponding of said first plurality of plural phase cables;

(b) a second plurality of male terminals for attachment to corresponding of said second plurality of plural phase cables, said male terminals being adapted to matingly contact said female terminals;

(c) a female housing including first means for mounting said first plurality of female terminals within said female housing in a spaced relationship with each other;

(d) a male housing adapted to be coupled with said female housing and including second means for mounting said second plurality of male terminals within said male housing in a spaced relationship with each other and in a manner that each of said second plurality of terminals is aligned with a corresponding one of said first plurality of terminals when said male housing is coupled to said female housing;

(e) said first and second mounting means comprised of respectively first and second support discs and first and second insulating members, said first and second support discs each including openings for respectively receiving said first and second plurality of female and male terminals, said first and second insulating members disposed respectively between each of said first and second plurality of terminals and their corresponding opening within said first and second support discs; and

(f) means for disposing each of said first and second mounting means at substantially ground potential, each of said first and second mounting means comprised of a material whose resistivity is selected to be sufficiently low to establish a conductive path through its mounting means from one of said terminals to said ground disposing means if a fault producing current should be applied to said one terminal, said ground disposing means comprises first and second ground means disposed in electrical connection with said first and second support discs respectively, said first and second ground means each comprising a ground cable and a ground terminal element adapted to be matingly received by the other ground terminal, each of said ground terminals being directly connected to its supporting disc, whereby said connected support disc is established at substantially ground potential.

4,420,203

SEMICONDUCTOR MODULE CIRCUIT INTERCONNECTION SYSTEM

Conrad J. Aug, Preston; Charles J. Guenther, and James B. Randolph, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 4, 1981, Ser. No. 270,427
Int. Cl.³ H01R *23/66*
U.S. Cl. 339—17 CF **12 Claims**

1. A circuit interconnection system for a semiconductor module carrier having a plurality of contact pads on a rigid planar surface, comprising:

a planar flexible printed circuit wiring assembly having first and second surfaces;

a plurality of mating contact pads on said first surface adapted to make electrical contact with contact pads on a module carrier;

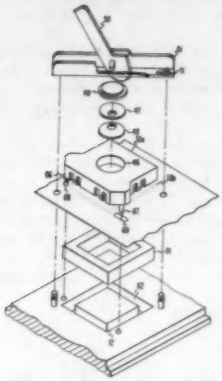
a plurality of raised solid contact bumps on each of said mating contact pads;

guide means on said flexible printed circuit wiring assembly for positioning a module carrier to place the plurality of contact pads on said module carrier in alignment with said mating contact pads of said flexible printed circuit wiring assembly;

an elastomeric backing element confronting said second surface of said flexible printed circuit wiring assembly in the region opposite said mating contact pads;

clamping means operable to compressively retain said flexible printed circuit wiring assembly between a module

carrier and said elastomeric backing element for maintaining compressive contact between module carrier contact



pads and said flexible printed circuit mating contact pads aligned therewith.

4,420,204

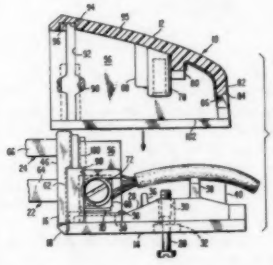
DEAD-FRONT ELECTRICAL WIRING DEVICE ATTACHABLE TO A POWER CORD

Henry Leong, Kendall Park, N.J., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 95,734, Nov. 19, 1979, abandoned. This application Jul. 20, 1981, Ser. No. 285,209

Int. Cl.³ H01R 13/512, 13/58

U.S. Cl. 339—63 R 6 Claims



2. A dead-front electrical connecting device for attachment to a power cord of the plural conductor type, comprising:

(a) a plurality of contact assemblies, each of which includes a contact element and a terminal adapted for connection of one of the conductors of a power cord;

(b) a two-piece housing that includes

(1) a first piece formed of two members connected by an integral hinge about which one of the members is swingable to a position in which it becomes a dead front upon which the contact assemblies are mounted, said one member, when in its dead front position, being substantially at a right angle to the other member with the terminals disposed within the angle defined between the members and having opposed side edges formed with locking tongues;

(2) a second piece formed wholly separately from the first piece and having an elongated channel shape so as to include a web and a pair of side flanges, the second piece having opposed grooves in the side flanges adapted to slidably receive and interengage with the locking tongues responsive to movement of the second piece bodily toward the first piece, the locking tongues and the opposed grooves, when interengaged, providing a fixed relationship between said one member and said second piece, said first piece and said second piece cooperating to define an enclosure in which the terminals are confined; and

(3) fastener means connecting the pieces in the enclosure-defining relationship thereof.

4,420,205

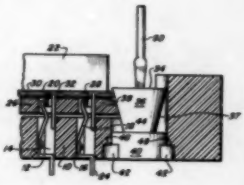
LOW INSERTION FORCE ELECTRONIC COMPONENT SOCKET

Michael Kirkman, Barrington, R.I., assignor to August Inc., Mansfield, Mass.

Filed Sep. 14, 1981, Ser. No. 301,989

Int. Cl.³ H01R 13/629

U.S. Cl. 339—74 R 10 Claims



1. An electronic component socket comprising:

a base of electrically insulative material;

an array of spring terminals disposed in the base in a configuration corresponding to the terminal pin configuration of an electronic component to be mated with the socket;

a plate disposed for slideable movement on the base and having openings through which the spring terminal respectively pass;

a camming element moveable between first and second positions and cooperative with the plate;

the camming element being operative in its first position to urge the plate to an open position to cause lateral movement of the spring terminals such that the spring terminals will not engage the pins of an electrical component in the socket;

the camming element being operative in its second position to permit return of the plate to a closed position in which the spring terminals will be in electrical contact engagement with the pin of an electrical component in the socket; wherein

the scanning element comprises a plug having a head with a conical surface cooperative with an edge of the plate to cause lateral movement thereof upon axial movement of the plug.

4,420,206

ELECTRICAL CONNECTOR

Gerald J. Martyniak, Indianapolis, Ind., assignor to Western Electric Company, Inc., New York, N.Y.

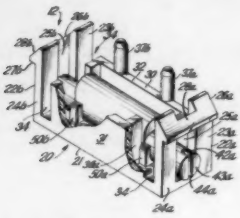
Filed Nov. 30, 1981, Ser. No. 325,941

Int. Cl.³ H01R 9/07

U.S. Cl. 339—75 M 17 Claims

1. A connector comprising a downwardly open housing adapted to be placed over vertically superposed carriers having registering conductive areas on the carriers' adjacent surfaces, said housing having longitudinally spaced downwardly extending portions with means at their lower ends for coupling said housing with the lower of said carriers, and pressure generating means comprising a longitudinally extending wedging body of non-circular cross section received between said portions in said housing, said body having a greater dimension

in one than in the other of its cross-sectional coordinates and having, moreover, rear and front contact faces on the opposite sides of said body separated by said greater dimension, said housing providing as a part thereof a web portion forming at the top of said housing at least a partial closure over the interior thereof, and said body being adjustable in said housing between first and second settings at which, with said such housing being over said carriers and coupled with the lower



one, said body is adapted to be, respectively, inoperable at said first setting to produce significant force on said carriers, and wedgingly positioned in said housing at said second setting between said web portion and carriers with said rear and front contact faces being simultaneously in a force coupled relation with, respectively, said web portion and said carriers so as to be productive by said rear face of a loading force on said web portion and by said front face of downward pressure on said carriers for pressing said registering areas together.

4,420,207

SOCKET HAVING MEANS OF NO-LOAD ENGAGING WITH AND RELEASING FROM ELECTRONIC UNIT

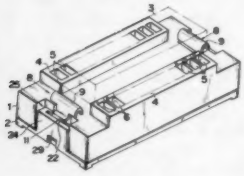
Kinichi Nishikawa, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed May 14, 1981, Ser. No. 263,507

Claims priority, application Japan, May 28, 1980, 55-73558[U]

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—75 M **5 Claims**



1. A socket for an electronic unit having a plurality of wires depending therefrom, said socket comprising:

a base plate having at least one row of vertical openings therein for receiving corresponding lead wires from the electronic unit;

a connector plate having at least one row of contacts and on which said base plate is mountable with the openings aligned with said contacts and the contacts extending into said openings, said base plate and said connector plate being movable toward and away from each other between contact engagement and release positions of said contacts and the lead wires of the electronic unit on said base plate with the lead wires extending through said openings;

a pair of resilient lock members, one at each of the opposite end portions of said base plate and having one portion normally resiliently urged away from said end portions of said base plate;

a pair of retainers, one at each of the corresponding opposite end portions of said connector plate, and said one portion of each resilient lock member having a retainer engaging means engageable with the corresponding retainer by the resilient urging of said one portion away from said end of said base plate when said base plate is at said engagement position; and

said lock members each having a finger operating portion projecting upwardly from the upper surface of said base plate and movable toward the corresponding ends of said base plate to release said retainer engaging means from said retainers;

said row of openings being located in said base plate for causing an electronic unit to be positioned between said finger operating portions with the electronic unit adjacent said finger operating portions when the electronic unit is mounted on the base plate with the depending lead wires extending into said openings, whereby when said finger operating portions of said lock members are moved toward each other to release the lock members from said retainers, the electronic unit is gripped between the fingers of the operator.

4,420,208

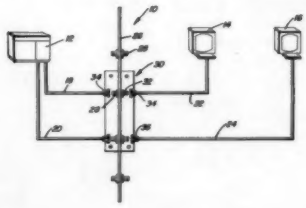
PANEL MOUNTED CONNECTOR

Gary W. Holland, and Robert H. Holland, both of P. O. Box 1761, Decatur, Ala. 35602

Filed Apr. 15, 1981, Ser. No. 254,398

Int. Cl.³ H01R *13/44*

U.S. Cl. 339—88 R **9 Claims**



1. In combination with a cable connection assembly having a connection panel provided with opposed external surfaces and cable attachment means mounted on the panel for removably coupling a plurality of cables to each other, said cables extending from the opposed external surfaces of the panel, the improvement residing in said panel being a multi-layered board having an inner layer forming surfaces contrasting with the opposed external surfaces of the panel, and two outside layers on which the opposed external surfaces are formed, said opposed surfaces being engraved to visually expose portions of the contrasting surfaces of the inner layer through the outside layers forming identification indicia for the cables extending from the opposed surfaces of the panel.

4,420,209

PLUG CONTACT

Edmund Reis, and Arthur Wondra, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 239,053

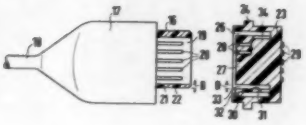
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012239

Int. Cl.³ H01R *13/627*

U.S. Cl. 339—91 R **9 Claims**

1. A plug contact assembly having a female plug section and male plug section arranged for locking interconnection, comprising a free and resilient tongue supported at one end by and extending longitudinally from a plug head associated with said female plug section and spaced from an associated planar bottom surface of said plug head to define a longitudinally

directed slot, said tongue being formed with a detent hump directed towards said planar bottom surface in said slot, said female plug section having an exterior wall extending annularly spaced around said tongue and said plug head and forming an annular recess therewith, said annular recess being provided for receiving therein in interconnection a plug socket wall associated with said male plug section, said socket wall having a planar base wall, formed with an exterior recess in the outer surface thereof, for fitting into said slot, connector pin



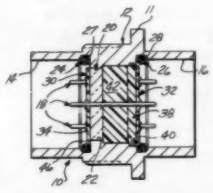
means disposed in a cavity defined by said plug socket wall, contact hole means disposed in said plug head for respectively receiving insertion of said connector pin means upon interconnection of said male and female plug sections, wherein the height of said slot substantially corresponds to the thickness of said base wall such that said tongue is biased downwardly during insertion of said base wall in said slot as said detent hump rides along said base surface until said detent hump enters said exterior recess during interconnection of said female and male plug sections.

4,420,210

HERMETIC THROUGH BULKHEAD ELECTRICAL CONNECTOR

James J. Karol, Unadilla, and Thornton J. Young, Bainbridge, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sep. 17, 1981, Ser. No. 303,294
Int. Cl.³ H01R *13/52*
U.S. Cl. 339—94 M **3 Claims**



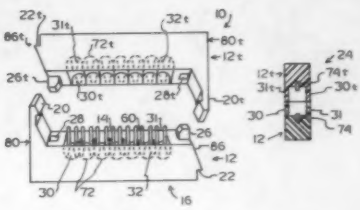
1. In combination with a hermetic through-bulkhead electrical connector comprising a generally cylindrical connector shell, at least one contact mounted within said shell, the improvement comprising a glass bead insert fused to said shell and said contact, and having an end face at a precisely predetermined axial location; a first interfacial seal bonded to said end face; a non-conductive, non-glass insert bonded to the interior of said connector shell and to said at least one contact at an axially spaced location from the opposite side of said glass bead insert, said connector shell being formed with an internal shoulder and said non-glass insert located against said shoulder, thereby defining a second precisely located end face remote from said fused glass bead insert; and a second interfacial seal bonded to said second end face, whereby two precisely located interfacial seals may provide effective interfacial sealing on either side of said connector.

4,420,211

FLAT ELECTRICAL CABLE SPLICER

James A. Ledbetter, St. Charles, Ill., assignor to Belden Corporation, Geneva, Ill.

Filed Aug. 10, 1981, Ser. No. 291,797
Int. Cl.³ H01R *9/08*
U.S. Cl. 339—98 **8 Claims**



1. An apparatus for splicing one or more conductors of a flat cable to corresponding conductors in an adjacent overlying cable or cables comprising a housing formed of two housing members which are adapted to interengage with each other, each housing member having a generally rectangular surface contoured face formed of insulating material having a plurality of colinear grooves therein so as to conform to one side surface of said flat cable so that a short length of said flat cable can lie along and nest within said contoured surface, each of said housing members having facing grooves of substantially identical shape, means projecting upwardly from at least one end of each housing member which is adapted to interlock with the opposite end of the other housing member to interengage said housing members, said contoured faces of said housing members extending generally parallel to and facing each other when said housing members are interengaged, the grooves of the interengaged housing members being spaced apart a distance approximately equal to the thickness of the overlying cables which are to be spliced together so as to snugly hold said cables in said overlying position, and one or more upwardly extending generally U shaped piercing members formed of conductive material and having a lower end extending downward from the closed end of the U which extends into and tightly fits within a corresponding slot extending downwardly from the contoured face of one of the shell sections, the upward extending sides of said piercing means forming spaced apart prongs which are adapted to pierce through the insulation of said overlying cables and extend into a corresponding slot in the facing housing member of said interengaged housing members, the prongs of each piercing member being of such width and spacing that when the two shell sections are interengaged it selectively pierces the insulation of and tightly engages a pair of selected overlying conductors of the cables which are to be spliced together, and end seal means at the ends of the grooves for selectively being open to cables passing through and closed to protect cable ends terminating in the apparatus.

4,420,212

POLARITY INDICATING BATTERY BOOSTER CABLE ASSEMBLY

Bruce R. Wright, St. Louis, Mo., assignor to Associated Equipment Corporation, St. Louis, Mo.

Continuation of Ser. No. 186,455, Sep. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 158,681, Jun. 12, 1980. This application Sep. 30, 1982, Ser. No. 429,471
Int. Cl.³ H01R *11/22*
U.S. Cl. 339—113 L **7 Claims**

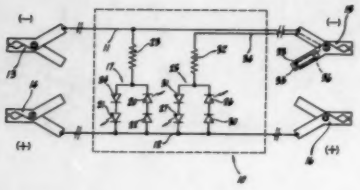
1. A polarity indicating battery booster cable assembly, comprising:

(a) a pair of booster wires having first ends and second ends,

(b) first battery attachment means connected to the first ends of the pair of booster wires,

(c) a first indicating means operatively connected to the first battery attachment means for indicating the polarity of connection of the first battery attachment means,

(d) a second battery attachment means connected to the second ends of the pair of booster wires, the pair of



booster wires providing continuous uninterupted electrical connections between the first and second battery attachment means, and

(e) a second indicating means operatively connected to one of the booster wires and including a test probe for determining the polarity for connection of the second battery attachment means.

4,420,213

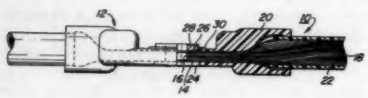
SEALED BATTERY THREADED STUD TERMINATION

Victor J. Julian, 2400 Belvue, Westchester, Ill. 60153, and Kenneth A. Julian, 409 Suffolk La., Oak Brook, Ill. 60521

Division of Ser. No. 149,349, May 13, 1980. This application Jun. 7, 1982, Ser. No. 386,421

Int. Cl.³ H01R *13/52*

U.S. Cl. 339—116 R **3 Claims**



1. A termination assembly for connecting an electric cable to a terminal stud of a battery, comprising

a terminal plate having an aperture extending from the top to bottom thereof for receiving said stud,

means electrically and mechanically connecting said plate to said cable,

a plastic, insulating cover molded directly over the top and bottom surfaces of said terminal plate and having openings formed therein above and below said plate in alignment with said aperture for receiving said stud,

the portion of said cover disposed over the top of said plate including an integral, annular resilient sealing bead spaced from and surrounding said opening therein,

an annular metallic member positioned in said opening in the portion of said cover disposed over the top of said plate in abutting relationship with the top of said terminal plate,

said metallic member having a central opening aligned with said openings and said aperture, and

said metallic member having a planar distal end surface spaced from said terminal plate by a distance which is greater than the distance of the distal end of said bead from said terminal plate.

4,420,214

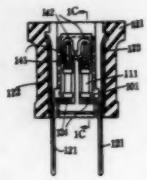
ELECTRICAL PLUG AND SOCKET HAVING REPLACEABLE OVERCURRENT-PROTECTION DEVICE PROVIDED WITH SAFETY LATCH MEANS

Jeng-Shyong Wu, No. 133 Tungshing Rd., Toufun, Maulii, Taiwan

Filed Feb. 14, 1980, Ser. No. 121,324

Int. Cl.³ H01R *13/06*

U.S. Cl. 339—147 P **7 Claims**



1. In an electrical connection device constituting a plug and having an insulating body, a pair of electrical conductors entering said insulating body and terminating in respective connection terminals, a pair of connection electrodes for defining a pair of prongs extending from a forward end of said insulating body to be connected to a mating device and apertures in said forward end of said body through which said prongs extend for connection thereof to said mating device at said forward end of said insulating body, replaceable overcurrent-protection device means positioned within said insulating body and connecting each of said connection terminals to a corresponding one of said connection electrodes to complete an electric circuit, and at least one opening into said insulating body for fitting and removing the overcurrent-protection device means, the improvement comprising safety latch means including at least one latch member adapted to be inserted into said insulating body from said forward end thereof to hold the overcurrent-protection device means in position and to close each said opening for thereby preventing access to the overcurrent-protection device means, the direction in which the latch member is removed from said insulating body being thereby the same as the direction in which said connection device is connected to said mating device, whereby the removal of the latch member and the replacement of the overcurrent-protection device can be effected only if said connection device has been separated from said mating device, the overcurrent-protection device means defining an opening and the latch member being adapted to provide interengagement with the last-said opening to hold the overcurrent-protection device in position within said insulating body.

4,420,215

VARIABLE EFFECTIVE LENGTH CANTILEVER CONTACT AND CONNECTOR

John N. Tengler, Chardon, Ohio, assignor to A P Products Incorporated, Mentor, Ohio

Filed Dec. 26, 1979, Ser. No. 107,352

Int. Cl.³ H01R *13/50*

U.S. Cl. 339—176 R **31 Claims**

1. An electrical contact, comprising contacting means for electrically connecting with a member inserted to engagement therewith, and support means for supporting said contacting

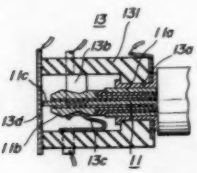
means in position for such engagement, said support means including at least one cantilever-like portion having an effective length that varies substantially continuously over at least a portion thereof during deformation thereof.

4,420,216

CONNECTING DEVICE

Kazuyasu Motoyama; Toshihiro Nakao; Mitsuo Nasu, and Yoshio Tomizawa, all of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Aug. 11, 1981, Ser. No. 292,039
Claims priority, application Japan, Aug. 13, 1980, 55-111530
Int. Cl.³ H01R *13/06*
U.S. Cl. 339—183 **5 Claims**



1. A connecting device comprising, a plug member arranged to be connected to an external load and including a conductive sleeve, a conductive tip extending out from within said conductive sleeve, a movable pin projecting from an end portion of the tip, and a jack member arranged to be mounted on a housing of an electrical apparatus and including a first contact segment for contacting with the conductive sleeve of the plug member, normally closed second and third switching contact segments arranged to separate from each other by action of the tip of the plug member wherein one of said second and said third contact segments electrically contacts the tip of the plug member, and a fourth contact segment for electrically contacting with the pin of the plug member to supply a source voltage from within the electrical apparatus to the external load through the pin of the plug member.

4,420,217

SWITCHABLE ON-AXIS OPTICAL BANDSTOP FILTER

Reinhold Gerharz, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

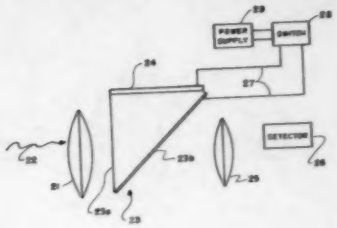
Filed Dec. 16, 1982, Ser. No. 450,322
Int. Cl.³ G03H *1/04*; G02B *5/32*
U.S. Cl. 350—362 **4 Claims**

1. An optical bandstop filter capable of being erased and a new filter formed, including:

an erasable photosensitive medium;

means for directing coherent and noncoherent optical radiation through said medium;

means for retroreflecting said radiation into said medium whereby the coherent radiation establishes standing waves in said medium; and



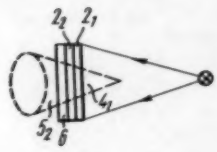
means for fixing said standing wave in said medium whereby an interference filter for said coherent radiation is formed.

4,420,218

METHOD OF OBJECT IMAGING

Alexandr S. Rubanov; Leonid V. Tanin; Ljudmila V. Vasilieva; Anatoly N. Kalinin; Vyacheslav A. Bursky, and Felix V. Vidmant, all of Minsk, U.S.S.R., assignors to Institut Fiziki an Bssr, U.S.S.R.

Filed Feb. 23, 1981, Ser. No. 237,377
Claims priority, application U.S.S.R., Apr. 19, 1980, 2912365; May 26, 1980, 2922101
Int. Cl.³ G03H *1/22*
U.S. Cl. 350—3.85 **42 Claims**



1. A method of object imaging, comprising the following steps: recording of a holographic image of an object on a substrate; formation of a two-dimensional image of the same object on a separate substrate; mutual arrangement of said substrate having the holographic image thereon and said substrate having the two-dimensional image thereon for orientation of these images; and reconstruction of said images through illumination of said substrates by a light beam of varying intensity and of varying spatial coherence.

4,420,219

OPTICAL WAVEGUIDE CONNECTOR USING ASPHERIC LENSES

Franz Muchel, Königsbronn, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

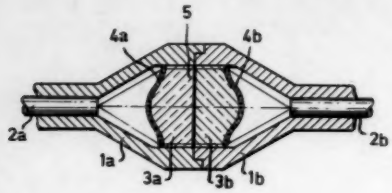
Filed Mar. 17, 1981, Ser. No. 244,755
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1980, 3010347
Int. Cl.³ G02B *7/26*
U.S. Cl. 350—96.18 **13 Claims**

1. A device for connecting first and second light guides to an external part comprising:

first and second light guide housing means for mounting said light guides corresponding to said first and second light guides, said light guides extending into said housing means; and

a converging aspheric plano-convex lens for each of said first and second light guide housing means, constructed and arranged to be disposed so that the focal point of said lens is disposed at the end surface of said light guides, said

plano-convex lens having an aspherically shaped surface and a planar surface, said aspherically shaped surface facing said light guides, said planar surface forming a coupling side surface and being constructed and arranged to support an immersion fluid disposed between said planar coupling side surface and said external part.

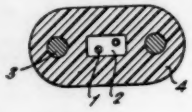


4,420,220

OPTICAL GUIDES

Noel S. Dean; Kenneth L. Lawton, and Vincent A. Yates, all of Wigan, England, assignors to BICC Public Limited Company, London, England

Continuation of Ser. No. 51,503, Jun. 25, 1979, abandoned, which is a continuation of Ser. No. 645,333, Dec. 30, 1975, abandoned. This application Nov. 4, 1980, Ser. No. 203,996
The portion of the term of this patent subsequent to Mar. 4, 1997, has been disclaimed.
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.23 14 Claims



1. An optical communication cable for transmission of light having a wavelength within the range 0.8 to 1.3 micrometers, which cable comprises an extruded elongate body of insulating material having extending throughout its length at least one bore which is defined by a substantially smooth continuous boundary wall, which is of substantially uniform transverse cross-section throughout the length of the bore; at least one non-twisted optical fibre which is housed loosely in and throughout the length of the bore and which is of a diameter substantially less than the diameter of the bore so that at any transverse cross-section of the cable throughout the whole of its length the at least one optical fibre if free to move in any direction within the bore of the extruded elongate body when the cable is flexed; and, embedded in the extruded elongate body throughout the whole of the length of the body and arranged on opposite sides of and substantially parallel to the bore, at least two separate elongate reinforcing members.

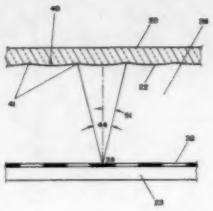
4,420,221

PASSIVE ANIMATED, OR PATTERN CHANGING SIGN

Lawrence N. Sparks, P.O. Box 134, San Marcos, Calif. 92069

Filed Mar. 19, 1982, Ser. No. 359,919
Int. Cl.³ G02B 27/00; G03B 25/02; G09F 13/02, 13/16
U.S. Cl. 350—167 10 Claims

1. A lenticular lens array comprising a sheet of transparent material having at least one side composed of a plurality of parallel, elongated, lenticular, and convex lens elements with concave lens elements at each cusp formed by adjacent convex lens elements.

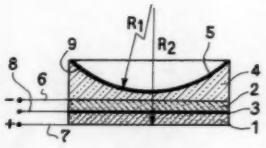


4,420,222

MIRROR HAVING A VARIABLE FOCAL LENGTH

Georges Bret, Verrieres le Buisson, and Guy Michelet, Paris, both of France, assignors to Quantel S.A., Orsay, France

Continuation of Ser. No. 896,081, Apr. 13, 1978, abandoned. This application Apr. 10, 1981, Ser. No. 253,079
Int. Cl.³ G02B 5/10
U.S. Cl. 350—295 19 Claims



1. A mirror having a reflecting surface, the entire area of which is intended to selectively focus an image reflected thereby in a continuously variable focal plane, the variation of which is obtained by a deformation of the structure of that mirror, the latter comprising a multilayer structure at least one component of the component layers of which is made from piezoelectric material the thickness of the entire multilayer structure being in the order of magnitude of one millimeter, and electrodes combined with said multilayer structure for applying voltage to said multilayer structure, said multilayer structure having an outer face, said reflecting surface being provided on said outer face, the mirror constructed in this way having outer faces at least one of which outer faces comprises at least one zone having a given curvature in the non-excited state of said multilayer structure, whereby said electrodes are connected to terminals adapted to be supplied with a selectively variable voltage the variation of which causes said image to be selectively focused in said focal plane.

4,420,223

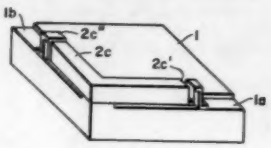
OPTICAL APPARATUS HAVING A MIRROR

Yoshio Watanabe, and Nobuo Iijima, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 27, 1981, Ser. No. 325,383
Claims priority, application Japan, Nov. 28, 1980, 55-167511
Int. Cl.³ G02B 5/08
U.S. Cl. 350—310 15 Claims

1. An optical apparatus for a stage comprising;
a supporting portion provided on said stage,
a mirror which is fixed at a single portion thereof to said

supporting portion and having a free end portion not fixed to said stage, and



a buffering member in contact with an end surface of said free end portion of said mirror.

4,420,224

LIQUID CRYSTAL DISPLAY CELL, PROCESS FOR ITS PRODUCTION AND CELL PLATE

Meinolph Kaufmann, Fislisbach, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

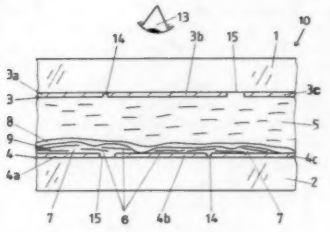
PCT No. PCT/CH80/00034, § 371 Date Nov. 10, 1980, § 102(e) Date Nov. 10, 1980, PCT Pub. No. WO80/01959, PCT Pub. Date Sep. 18, 1980

PCT Filed Mar. 6, 1980, Ser. No. 212,710

Claims priority, application Switzerland, Mar. 8, 1979, 2232/79

Int. Cl.³ G02F *1/133;* G02B *1/10;* B05D *5/06;* C08K *7/06*

U.S. Cl. 350—338 **9 Claims**



1. A process for the manufacturing of a liquid crystal display cell, comprising:

coating two cell plates on the interior surface with electrodes;

coating at least partially onto the electrodes of the second cell plate with a mixture comprising flake-like aluminum particles and at least a fluid organic orthosilicate (at normal temperature) with the formula

wherein R^1, R^2, R^3 and R^4 are similar or different single value organic radicals, of which the corresponding hydroxyl compounds are volatile, whereby the mixture is hydrolyzed to form silicic acid prior to, during or after the coating;

heating the second cell plate at temperatures from 300° C. to 550° C., and so annealing a reflective layer consisting of flake-like aluminum particles embedded in a practically homogeneous, transparent layered matrix mainly comprising SiO_2; and

assembling the two cell plates as a cell.

4,420,225

LENS OF A HOMO- OR COPOLYMER OF A FLUORINE CONTAINING STYRENE POLYMER

Bruno Bömer, Leverkusen; Carlhans Süling; Joachim König, both of Odenthal; Hans Hespe, Leverkusen; Carl Heynemann, Taufkirchen, and Raimund Weber, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

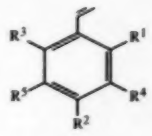
Division of Ser. No. 179,621, Aug. 20, 1980, abandoned. This application Sep. 25, 1981, Ser. No. 305,756

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936131

Int. Cl.³ B29D *11/00;* G02B *3/00*

U.S. Cl. 350—409 **13 Claims**

1. A lens comprising a homopolymer which contains, as a monomer unit, at least one styrene of the formula



in which

R^1, R^2 and R^3 independently of one another denote hydrogen or partly or completely fluorinated alkyl or alkoxy and

R^4 and R^5 independently of one another represent hydrogen or fluorine,

the total number of fluorine atoms in the radicals R^1 to R^5 being at least 3 and the total number of carbon atoms in the radicals R^1 to R^3 being at most 8, said homopolymer having an n_D value of between about 1.42 and about 1.55 and a ν_D value of between about 30 and about 50, and said homopolymer selected from the group consisting of ortho-, meta- and para-trifluoromethyl styrene.

4,420,226

ZOOM LENS OF SHORT TOTAL LENGTH

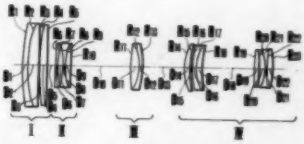
Nozomu Kitagishi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1980, Ser. No. 218,940

Claims priority, application Japan, Dec. 28, 1979, 54-171342

Int. Cl.³ G02B *7/04*

U.S. Cl. 350—427 **2 Claims**



1. A zoom lens of short total length comprising:

four component lens groups:

the first lens group being of positive refractive power and movable along an optical axis to effect focusing;

the second lens group being of negative refractive power and movable along the optical axis to effect zooming;

the third lens group being of positive refractive power and movable along the optical axis together with said second lens group to maintain an image plane at a constant position during zooming;

the fourth lens group being of positive refractive power and fixed; said fourth lens group including front and rear subgroups;

said front subgroup consisis of, in order from the object end, a first component of positive refractive power with a

convex surface of the strongest refractive power among said front subgroup disposed on the object end, a second component having a lens of negative refractive power with a convex surface disposed on the object end and a meniscus lens of positive refractive power and composed of two lenses cemented together;

said rear subgroup including a first component of positive refractive power and a cemented meniscus component with a concave surface disposed on the object side; and

assuming that the focal length of the fourth lens group is, F_R, the composite focal length of the first component and the second component of the front subgroup is F_{I-II}, and the radius oi curvature of the cemented surface of the meniscus lens of the front subgroup is rR_4, the following relations prevail:

$$0.65 < F_{I-II}/F_R < 0.71 \quad (1)$$

$$0.14\ F_R < r_{R4} < 0.24\ F_R \quad (2)$$

4,420,227

BRIDGE PAD ASSEMBLY FOR METAL SPECTACLE FRAMES

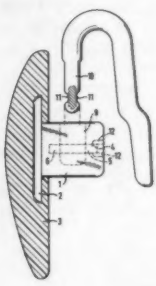
Herbert Speer, Dorfwiesenstrasse 92, D-7130 Muehlacker-Enzberg, Fed. Rep. of Germany

Filed Nov. 27, 1981, Ser. No. 325,492

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044615

Int. Cl.³ G02C *1/00, 5/12*

U.S. Cl. 351—138 **8 Claims**



1. In a bridge pad assembly for a metal spectacle frame, comprising

a bridge pad;

a bracket;

a bridge pad holder comprising a connector, which is resiliently locked to said bracket; and a baseplate carried by said connector at one end thereof and anchored in said pad,

the improvement residing in that

said connector has a cavity which is closed at one end by said baseplate and open at the other end, a crosspiece extending through said cavity and spaced from said baseplate, and a transverse bore, which intersects said cavity between said baseplate and said cross-piece and extends transversely to the latter,

said bracket has a free end portion, which is fitted in said transverse bore and formed with lateral recesses on opposite sides, and

a U-shaped spring clip is fitted in said cavity and closes the latter at said other end and straddles said crosspiece and resiliently interlocks with said lateral depressions.

4,420,228

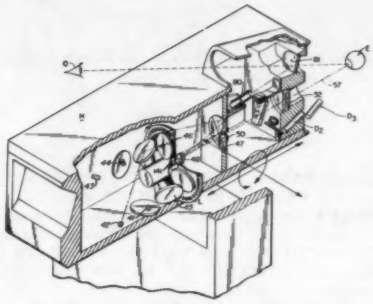
METHOD AND APPARATUS FOR ANALYSIS OF CORNEAL SHAPE

William E. Humphrey, San Leandro, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Continuation-in-part of Ser. No. 158,849, Jun. 12, 1980. This application Jun. 27, 1980, Ser. No. 163,663

Int. Cl.³ A61B *3/10*

U.S. Cl. 351—212 **5 Claims**



1. A process for determining the shape of the cornea of the eye comprising: fixating the eye along a line of sight for measuring the eye at a first fixation; measuring the eye relative to said first fixation to determine sphere, cylinder and axis; fixating the eye at a second fixation; measuring the eye relative to said second fixation in sphere, cylinder and axis; fixating the eye at a third fixation; measuring the eye relative to said third fixation in sphere, cylinder and axis; determining from a combination of at least a portion of each said measurements of sphere, cylinder and axis at least one of the following parameters: central "k" readings in sphere, cylinder and axis; corneal shape factor; corneal decentrations; fits of corneal measurement to an overall elliptical corneal shape; vault height; cap size; "k" readings transposed to the corneal apex.

4,420,229

OPHTHALMIC INSTRUMENTS

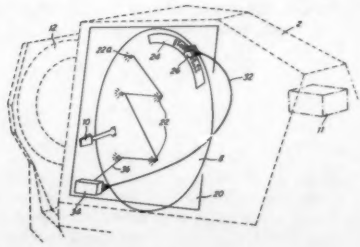
David L. Lewis, Harlow, England, assignor to Clement Clark International Ltd., England

Filed Feb. 10, 1982, Ser. No. 347,564

Claims priority, application United Kingdom, Feb. 13, 1981, 8104534

Int. Cl.³ A61B *3/02*

U.S. Cl. 351—224 **8 Claims**



1. An ophthalmic instrument for displaying different patterns of light spots in a series of visual tests, the instrument comprising an apertured shutter arrangement at a first location having a series of different settings for determining the pattern of light spots to be displayed at a first location to a subject to be tested, said shutter arrangement comprising fixed and dis-

placeable shutter members and the selection of different light-spot patterns being effected by movement of the displaceable member relative to said fixed member, the instrument further comprising a screen at a second location for displaying each said pattern selected in a manner that is not visible to the subject observing the pattern displayed at said first location, a series of light-emitting elements being disposed in spaced positions over the area of the screen for producing said patterns on the screen, radiation transmitting and sensing means adjacent the apertured shutter arrangement for actuating said light-emitting elements, reflecting means in the path of radiation from said transmitting means for reflecting the radiation to the sensing means, said reflecting means and said radiation transmitting and sensing means being relatively displaceable with said movement of the displaceable shutter member and said reflecting means transmitting to said sensing means a different reflection characteristic for each displayed light-spot pattern associated with a respective setting of the shutter arrangement, actuation means for said light-emitting elements being connected to the radiation sensing means whereby the response of the sensing means to each reflective radiation characteristic actuates the light-emitting elements corresponding to the selected light-spot pattern to display the pattern on the screen at said second location.

4,420,230

PRODUCTION OF THREE DIMENSIONAL MOTION PICTURES

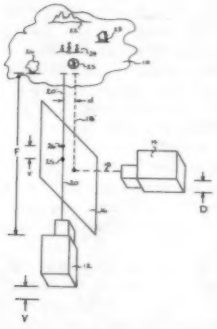
Robert H. McElveen, 212 W. Jefferies St., Gaffney, S.C. 29340

Continuation-in-part of Ser. No. 69,708, Aug. 27, 1979, Pat. No. 4,303,316. This application Oct. 26, 1981, Ser. No. 314,799

The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.

Int. Cl.³ G03B *21/32*

U.S. Cl. 352—43 **13 Claims**



1. An improved process for reproducing a visual scene which may be viewed in stereopsis by the unaided human eye comprising the steps of:

(a) recording a plurality of right and left views of a common visual scene from corresponding recording positions displaced from each other in a first direction at a distance of no more than about one inch and displaced from each other in a second direction generally perpendicular to said first direction at a distance of no more than about one inch, and

(b) continuously projecting, in alternation, a sequential group of one or more of said right recorded views and a sequential group of one or more of said left recorded views onto a receiving surface for viewing by the human eye, said duration of projection of said alternating groups being such that the visual duration of each group on said surface varies from a minimum to a maximum duration which is generally correspondingly proportional to the distance of the nearest non-moving object of special regard in the scene from said recording positions, and wherein said duration is approximately equal to the visiopsychological alternation rate between right and left views of the human visual apparatus.

4,420,231

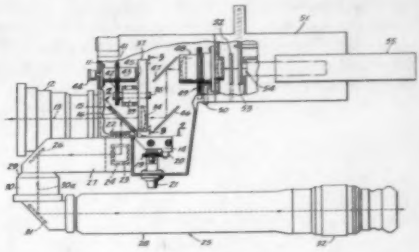
MOTION PICTURE CAMERA

Robert E. Gottschalk, Los Angeles, Calif., assignor to Panavision, Incorporated, Tarzana, Calif.

Filed May 17, 1982, Ser. No. 378,854

Int. Cl.³ G03B *3/00*

U.S. Cl. 352—142 **7 Claims**



1. A motion picture camera device comprising, in combination: a housing, a prime 35 mm lens assembly mounted on said housing, a viewfinder eyepiece assembly pivotally mounted on said housing to turn about a horizontal axis, a 16 mm motion picture camera, means for transmitting light from the prime lens assembly to either the motion picture camera or to the viewfinder eyepiece assembly, or both, the light path to the motion picture camera including spaced fixed mirrors, the first being positioned at an angle to the axis of the prime lens assembly, to receive light therefrom, the second reflecting light from the first, and a relay lens in said light path.

4,420,232

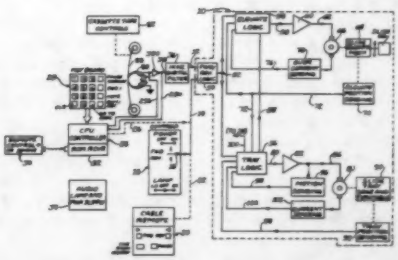
SELECTIVELY POSITIONABLE SLIDE TRAY POSITION SENSING ARRANGEMENT FOR SLIDE PROJECTOR APPARATUS

Nicholas Mischenko, Mount Prospect, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 31, 1981, Ser. No. 336,466

Int. Cl.³ G03B *23/04*

U.S. Cl. 353—25 **16 Claims**



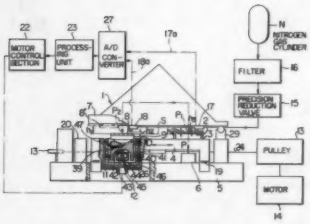
1. In a position sensing arrangement for sensing the position of a slide tray transport arrangement of a slide projector, the position sensing arrangement including a coded array arrangement arranged for movement in a manner directly correlated to movement of the slide tray transport arrangement, the coded array arrangement including two planar arrays of energy transmissive members arranged in respective predeter-

mined patterns, a first one of the arrays corresponding to a first predetermined plurality of positions of a first type of slide tray, the second of the arrays corresponding to a second predetermined plurality of positions of a second type of slide tray, the position sensing arrangement further including a position detection arrangement for detecting the position of the coded array arrangement, the position detection arrangement including an energy generating source and an energy detection arrangement, the energy generating source and the energy detection arrangement being disposed in a generally aligned condition at a predetermined detection station and on opposite sides of the coded array arrangement, wherein the improvement comprises the position detection arrangement comprising selectively positionable means being responsive to a predetermined portion of a tray of the second tray type for positioning the position detection arrangement to an aligned position with the second array when a tray of the second tray type is placed on the slide tray transport arrangement.

4,420,233
PROJECTING APPARATUS

Mineo Nomoto; Katsuhiro Iwashita, both of Yokohama; Toru Otsubo, Fujisawa, and Susumu Aiuchi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,675
Claims priority, application Japan, May 25, 1981, 56-78099
Int. Cl.[3] G03B *27/34, 21/28*
U.S. Cl. 353—122 16 Claims



1. A projecting apparatus comprising:

(a) projector means for forming an image of a projecting member with a pattern on an object of projection, said projector means including a unit magnification reflection optical system having a concave spherical mirror and a convex spherical mirror for projecting the image along an optical axis thereof;

(b) means for measuring a selected one of the distance from said projector means to said projecting member and the distance from said projector means to a holder means for holding said projecting member, said measuring means also measuring the distance from said projector means to said object of projection;

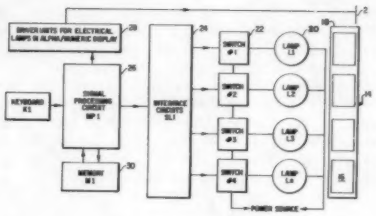
(c) means for computing the error of an image-forming position on the basis of the distance measurements taken by said measuring means; and

(d) moving means for moving along the direction of the optical axis of said projector means at least one of said projecting member, said object of projection and said projector means so as to eliminate the error of the image-forming position computed by said computing means and thereby attain an automatic focus adjustment.

4,420,234
COMBINATION TEXT AND PICTURE DISPLAY SYSTEM

Edward Dolejsi, 297 54th St., Delta, B.C., Calif.X (V4M 3G6), and Robert G. Archer, 555 Newdale Rd., West Vancouver, B.C., Canada (V7T 1W7)

Filed Mar. 12, 1982, Ser. No. 357,668
Int. Cl.[3] G03B *21/00*
U.S. Cl. 353—122 9 Claims



1. An integrated electronic dynamic alpha/numeric message and picture display system comprising:

(a) a matrix or segmented pattern of discreet light source devices which allow the forming of illuminated characters when an appropriate selection of said discreet light source devices are simultaneously energized;

(b) a picture retaining means for holding a series of individual pictures to be selectively displayed, picture illumination means for individually illuminating pictures in the picture retaining means, and electronic control means electrically associated with the picture illumination means to enable selective illumination of one or more pictures in the picture retaining means;

(c) a memory means to store and provide appropriate electrical signal instructions governing the selection and timing of the energizing of each said light source device, and governing the said selective illumination of one or more pictures;

(d) an encoding device associated with the memory means for coding and combining the said signal instructions into a single signal so as to inherently synchronize selected alpha/numeric passages with selected picture illumination;

(e) signal processing means to process signals from the memory means to translate the said signals into control signals for the light source devices and the electronic control means for picture selection and illumination;

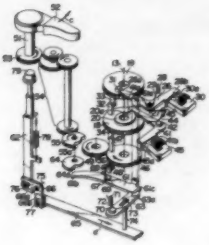
(f) a series of electrical switching circuits electronically associated with the signal processing means and with the light source devices to receive electrical control signals from the signal processing means and switch on power to temporarily energize the desired selection of light source devices, thereby producing the corresponding specific illuminated character as originally entered to the encoding device; and

(g) logic circuit means electronically associated with the electronic control means and the signal processing means to receive electronic signals from the signal processing means designated for the picture illumination means and produce a desired response of the electronic control means.

4,420,235
SHUTTER DRIVE SAFETY DEVICE FOR A CAMERA

Katumi Terada, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan

Filed Feb. 10, 1982, Ser. No. 347,569
Claims priority, application Japan, Apr. 23, 1981, 56-59552
Int. Cl.³ G03B *9/34, 17/38*
U.S. Cl. 354—266 **18 Claims**



1. A shutter drive safety device for a camera, comprising:

a first drive mechanism associated with a shutter opening member and including a first detent member which controls the operation of the shutter opening member, said first detent member moving between a first position wherein it engages and restrains said shutter opening member, and a second position wherein it disengages and frees said shutter opening member such that said shutter opening member is free to open said shutter;

a second drive mechanism associated with a shutter closing member and including a second detent member which controls the operation of the shutter closing member, said second detent member moving between a first position wherein it engages and restrains said shutter closing member, and a second position wherein it disengages and frees said shutter closing member such that said shutter closing member is free to close said shutter, said second detent member, when it is in its first position, being the only element which engages and restrains said shutter closing member;

a constraining member operative in response to a film winding operation to maintain said second detent member in its said first position; and

a release member operative in response to a shutter release operation to unlock said second detent member from constraint by said constraining member before said shutter opening member begins to operate.

4,420,236
CAMERA FOR USE WITH FILM HAVING SPROCKET HOLES AND/OR CODED PERFORATIONS

Nobuyuki Taniguchi; Takeo Hoda; Shigeru Oyokota, and Kiyoshi Seigenji, all of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 12, 1982, Ser. No. 377,447
Claims priority, application Japan, May 20, 1981, 56-77127
Int. Cl.³ G03B *7/24, 17/28*
U.S. Cl. 354—21 **16 Claims**

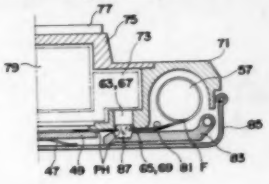
1. A camera for use with a film having coded perforations at the leader portion thereof preceding an initial frame and sprocket holes along substantially the entire length of film, comprising:

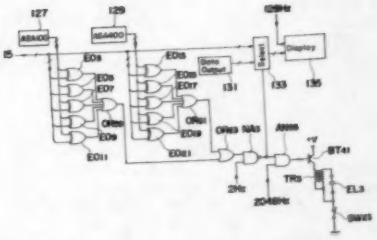
a camera body having a film take-up spool, a film housing chamber, a film take-up chamber housing said film take-up spool and an exposure station provided between said two chambers and having an exposure aperture;

a camera back cover operable between an opened position for allowing the loading of the film into said camera body and a closed position for covering the film loaded in the camera body;

a pressure plate provided on said camera back cover for resiliently abutting the film at said exposure station with the film loaded in said camera body and with said camera back cover being at the closed position;

film abutting means provided at a predetermined detecting position past said exposure station so as not to interfere with said pressure plate and including an inner cover plate pivoted at said film take-up chamber and located inside said camera back cover, said film abutting means being abuttable with the film past said expsoure station and cooperable with a part of said camera body to keep the film flat at the detecting position; and





means for detecting the coded perforations of the film at the detecting position for reading out information respresented by the coded perforations.

10. A camera for use with a film, comprising:

means for generating a signal of film sensitivity;

discriminating means for generating two different outputs in dependence upon whether or not said signal is consistent with a given signal of usual or standard film sensitivity;

film sensitivity display means for displaying the film sensitivity in accordance with said signal of film sensitivity; and

means for changing the displaying modes of said film sensitivity displaying means in accordance with said outputs from said discriminating means.

4,420,237
EXPOSURE CONTROL SYSTEM

Yukio Ogawa, Kawasaki; Isao Harigaya; Tateo Yamada, both of Yokohama, and Michio Hirohata, Inagi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 331,796, Dec. 17, 1981, abandoned, which is a continuation of Ser. No. 119,494, Feb. 7, 1980, abandoned. This application Dec. 17, 1982, Ser. No. 450,745
Claims priority, application Japan, Feb. 13, 1979, 54-15880; Feb. 13, 1979, 54-15881
Int. Cl.³ G03B *7/093*
U.S. Cl. 354—458 **25 Claims**

1. An exposure control system including:

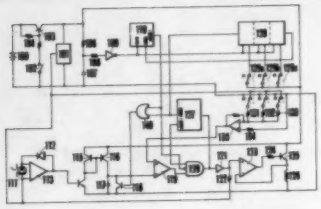
(a) electromagnetically operated shutter means operating under the action of an electromagnetic force and positioned to block and unblock light entering a photo-taking lens;

(b) a shutter drive circuit responsive to an actuating signal

for opening, and, after a predetermined time, closing said electromagnetically operated shutter;

(c) means for setting a number of exposures;

(d) a counter or counting each time said electromagnetically operated shutter means is closed after a an actuating signal and for producing a closing signal upon having counted the predetermined number set by the exposure number setting means;



(e) a flip-flop circuit for holding said shutter drive circuit in an operative position from the time of the actuating signal to that at which said counter produces the predetermined signal; and

(f) a timer circuit for preventing actuation of said shutter drive circuit from the initiation of a closing of said electromagnetically operated shutter to the termination of the closing thereof.

4,420,238

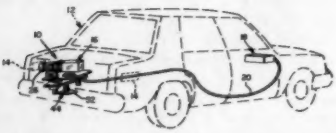
APPARATUS FOR ENABLING CONCEALING SURVEILLANCE BY USE OF A CAMERA IN A VEHICLE

Larry L. Felix, 1250 N. Manzanita, Canby, Oreg. 97013

Filed Apr. 19, 1982, Ser. No. 369,809

Int. Cl.³ G03B *37/02, 29/00*

U.S. Cl. 354—81 **10 Claims**



1. A camera-mount assembly for enabling a camera to be selectively panned and tilted comprising:

support means for securely holding the camera;

base means disposed adjacent said support means for positioning upon a surface;

first pivot means mounted on said base means operable for selectively pivoting said support means, relative to said base means, about a substantially vertical, first pivot axis disposed to extend substantially adjacent the camera lens thereby to pan the camera;

second pivot means interconnecting said base and support means operable for selectively pivoting said support means about a substantially horizontal, second pivot axis thereby to tilt the camera;

transfer means pivotally connected to said support means for defining said second pivot axis and for transferring motion from said first pivot axis to said support means;

said first pivot means including first power-driven means operable for imparting rotation, about said first pivot axis, to said transfer means and thereby to said support means; and

said second pivot means including second power-driven means drivingly coupled to an elevator means operable for selectively elevating and lowering said support means thereby to tilt said support means about said second pivot axis.

4,420,239

EXCHANGE MOUNT WITH DATA TRANSMITTING ELECTRICAL CONTACTS

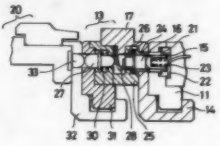
Haneishi Yasuyuki, and Shinsuke Komoto, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1982, Ser. No. 372,776

Claims priority, application Japan, May 1, 1981, 56-63619[U]

Int. Cl.³ G03B *17/00*

U.S. Cl. 354—286 **8 Claims**



1. An exchange mount for a camera mount of a camera body comprising:

a camera side mount member (**14**) capable of being mounted on said camera mount (**11**) of said camera body (**10**);

a fixing ring (**25**);

an "auto" and "manual" switching lever (**17**) connected to said fixing ring;

a lens mount member (**31**) and a lens mount (**32**) on which a lens barrel (**20**) is mounted;

a first electrical contact (**16**) located in said camera side mount member, said first electrical contact confronting and contacting a second electrical contact located in said camera mount when said camera side mount member is mounted on said camera mount, said second electrical contact being connected to a camera circuit;

contact pin means (**33, 27, 35**) located in said lens mount;

a switching contact (**28**) coupled to said switching lever, said switching contact electrically interconnecting said contact pin means and said first electrical contact when said switching lever is set to "auto" so that said contact pin means is electrically connected to said camera circuit.

4,420,240

TRIPARTITE CAMERA WITH RELEASABLE COUPLING BETWEEN EACH PART

Makoto Katsuma, Kawasaki; Toyokazu Mizogui, Kiyose; Takashi Isobe; Akira Hiramatsu, both of Yokohama; Hiroyasu Murakami, Tokyo, and Toyoki Ishida, Ageo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 354,935

Claims priority, application Japan, Mar. 13, 1981, 56-36933

Int. Cl.³ G03B *17/02*

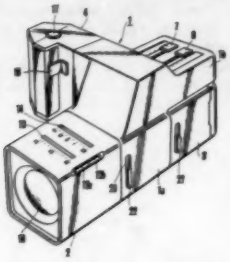
U.S. Cl. 354—288 **3 Claims**

1. A camera having at least three separable parts arranged in combination comprising:

fitting means for fitting each of said parts to another part so as to have portions thereof overlap, said fitting means being arranged to fit each of said parts so that at least one side of each part is arranged to lie in a common plane with a side of another part;

coupling means for coupling two successive parts with each other by respective coupling devices having common structures, said coupling means being operable between a locked state to retain said parts coupled together and an unlocked state to release the coupling engagement between said parts; and operating means for operating said coupling means to

bring said coupling means between said locked state and said unlocked state, said operating means being positioned re-



spectively at sides of said parts arranged to lie in a common plane with a side of another part.

4,420,241

MOUNTING ASSEMBLY FOR FILM-SQUEEZING ROLLERS

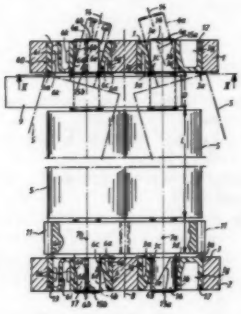
Alfons Kastl, Munich; Klaus Lehnert, Unterhaching; Horst Köninger, and Güter Schirk, both of Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,997

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150225

Int. Cl.³ G03D *9/02*

U.S. Cl. 354—319 **10 Claims**



1. In a film-treatment device having:

two spaced and generally parallel mounting plates each having a pair of plate holes,

respective pairs of journals in the plate holes having respective journal holes centered on a pair of journal axes, the journal holes of one plate being coaxial with the journal holes of the other plate and the two journal axes being parallel, and

rollers centered on respective roller axes and each having a pair of substantially cylindrical end trunnions centered on the respective roller axis and rotatably received in a respective one of the journal holes for rotation of the respective roller therein with its roller axis coaxial with the respective journal axis, the journals of one of the journal axes being constructed so the respective roller can move against spring force limitedly away from the other roller, the improvement wherein at least one journal of each journal axis is formed at the respective journal hole with:

two semicylindrical journal surfaces spaced axially apart, centered on the respective journal axis, of the same radius of curvature as the respective trunnion, and diametrically oppositely concave toward each other, whereby the respective trunnion rides on the respective journal surfaces with the respective roller axis lying on the respective rotation axis, and

two generally semicylindrical skew surfaces spaced axially apart, centered on respective skew axes inclined to and intersecting the respective rotation axes, of at least the radius of curvature of the respective trunnion, and diametrally oppositely concave toward each other, each of the skew surfaces being axially level relative to the respective journal axis with a respective one of the respective journal surfaces, the skew axes being at such an angle and so positioned relative to the respective journal axes that the respective trunnions can be inserted into the respective journals in surface contact with the respective skew surfaces.

4,420,242

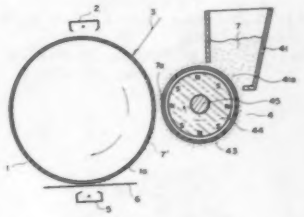
MAGNETIC BRUSH DEVELOPING AND CLEANING PROCESS

Keitaro Yamashita, Saitama, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 355,205

Int. Cl.³ G03G *15/09*

U.S. Cl. 355—3 DD **5 Claims**



1. A magnetic brush developing and cleaning process, comprising the steps of:

providing a magnet roll which includes a rotatable, non-magnetic cylindrical shell and a rotatable permanent magnet disposed within said shell, said rotatable permanent magnet having a plurality of adjacent magnetic poles in proximity to said shell;

forming a magnetic brush of a developer powder on said shell of said magnet roll;

developing electrostatic latent images by rotating at least said permanent magnet and softly rubbing said magnetic brush against electrostatic latent images on an image bearing surface;

transferring the developed images to a sheet; and

cleaning said image bearing surface by rotating said sleeve and said permanent magnet in opposite directions, and strongly rubbing said magnetic brush against said surface.

4,420,243

HOLD-DOWN ARRANGEMENT FOR COPY SHEET PICK-OFF SYSTEM

James M. Baker, Whitney Point, and David L. Vermaat, Port Crane, both of N.Y., assignors to Savin Corporation, Stamford, Conn.

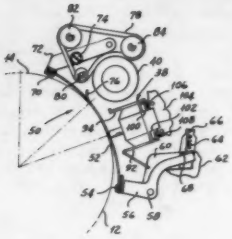
Filed Jul. 9, 1982, Ser. No. 396,781

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 TR **10 Claims**

9. In an electrostatic copier having a drum from which a developed electrostatic image is to be transferred to a copy sheet at a transfer station, a copy sheet hold-down finger having an opening therein and means including an eccentric in said

opening for mounting said finger at said transfer station with the end thereof in spaced relationship to the surface of said



drum and manually operable means for rotating said eccentric to adjust the position of said finger end relative to said surface.

4,420,244

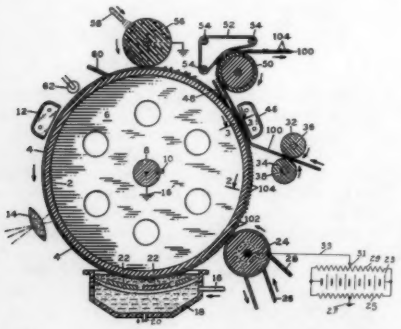
APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES FOR GAP TRANSFER TO A CARRIER SHEET

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Stamford, Conn.

Division of Ser. No. 267,465, May 27, 1981. This application Oct. 12, 1982, Ser. No. 433,658

Int. Cl.³ G03G *15/10, 15/14*

U.S. Cl. 355—3 TR **1 Claim**



1. An electrophotographic apparatus including in combination a photoconductor; means for moving said photoconductor past a corona charging station for imparting a charge of a certain polarity to the surface of said photoconductor; an imaging station; a developing station, said developing station including means for applying a developing liquid to said photoconductor, which developing liquid comprises a dielectric carrier liquid, toner particles, and spacing particles having a dielectric constant higher than the dielectric constant of said carrier liquid; a metering station; and a transfer station in succession; said metering station comprising metering means, means for mounting said metering means adjacent to the surface of the photoconductor, means for impressing a bias on said metering means of the same polarity as the charge on said photoconductor; and means for spacing a carrier sheet to which the developed image is to be transferred from the surface of the photoconductor; said spacing means comprising said spacing particles and means for positioning said carrier sheet at said transfer station.

4,420,245

ELECTROPHOTOGRAPHIC COPIER HAVING MOVABLE OPTICAL ELEMENTS FOR CHANGING THE MAGNIFICATION OF AN ORIGINAL DOCUMENT

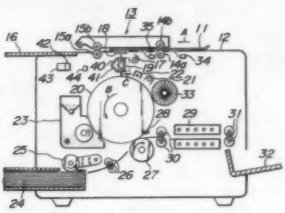
Hisashi Katao, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

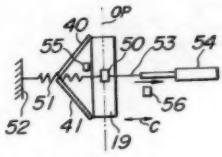
Filed May 27, 1982, Ser. No. 382,617

Claims priority, application Japan, May 30, 1981, 56-81850

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—11 **7 Claims**





1. An electrophotographic copier for forming a copy of a document comprising

means for moving a document to be copied through an exposing position;

means arranged at the exposing position for illuminating the moving document;

a life-size image projecting optical system having a converging optical fiber array which forms a life-size image of the illuminated document and being arranged movably between first and second positions with respect to an optical axis;

a modified-size image projecting optical system for forming a modified-size image of the illuminated document and having a plurality of optical elements at least one of which is secured to said converging optical fiber array, remaining optical elements being arranged fixedly;

means for moving said converging optical fiber array together with said at least one optical element of the modified-size image projecting optical system;

a photosensitive member arranged movably in synchronism with the movement of the document for receiving either one of said life-size image and modified-size image of the document to form a corresponding electrostatic latent image;

and

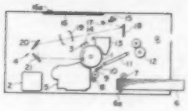
means for forming a duplicated copy with the aid of the latent image; whereby when said converging optical fiber array is in said first position, said life-size image is projected onto said photosensitive member, and when said converging optical fiber array is in said second position, said at least one optical element is in the optical axis to project the modified-size image of the document onto the photosensitive member.

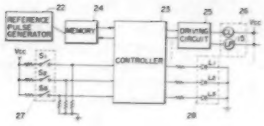
4,420,246

MULTIPLE REPRODUCTION APPARATUS

Mitsuhiro Nonaka, and Yuichi Kobayashi, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Japan

Filed Nov. 5, 1981, Ser. No. 318,424
Claims priority, application Japan, Nov. 6, 1980, 55-156228
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **7 Claims**





1. Apparatus for making at least one copy from an original comprising:

an original holder for holding thereon said original;

image forming means having an image forming surface on which a copy image of said original is to be formed,

an exposure system for exposing an image of said original onto said image forming surface;

driving means for intermittently driving after a wait time period either one of said original holder or at least a part of said exposure system for image exposing motion relative to the other, in a reciprocating manner between a home position from where an image exposing motion is initiated and an advanced position from where a returning motion back to said home position is initiated;

transferring means for transferring said copy image formed on said image forming surface to a transfer medium; and

wait time period control means for controlling the length of a wait time period at said home position between completion of a returning motion and initiation of a next image exposing motion of said one of said original holder or at least a part of said exposure system in response to the size of said original or transfer medium.

4,420,247

COMPUTER CONTROL MEANS FOR AN ELECTROSTATIC RECORDING APPARATUS

Koji Suzuki, Yokohama; Joji Nakahira, Tokyo; Koki Kuroda, Yokohama; Nao Nagashima, Tokyo, and Yoshiaki Takayanagi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

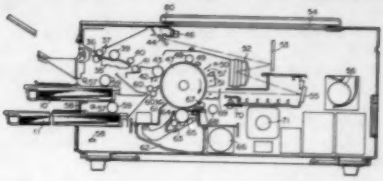
Filed Dec. 23, 1980, Ser. No. 219,513
Claims priority, application Japan, Dec. 28, 1979, 54-171351; Jan. 31, 1980, 55-12926; Jan. 31, 1980, 55-12928
Int. Cl.³ G03G *15/01*
U.S. Cl. 355—14 C **11 Claims**

9. A recording apparatus comprising:

a plurality of processing means for forming an image on a recording medium;

a first digital computer for controlling at least one of said processing means; and

a second digital computer for transferring data for image formation to said first digital computer wherein said first



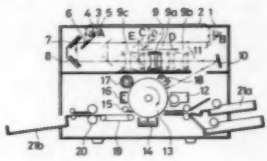
digital computer is initialized by a signal from said second digital computer.

4,420,248

VARIABLE MAGNIFICATION COPYING DEVICE

Ryota Ogawa, Kawagoe; Ikuo Negoro, Tokyo; Hisao Iwanade, Tsurugashima, and Yasunori Arai, Asaka, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1981, Ser. No. 244,476
Claims priority, application Japan, Mar. 25, 1980, 55-37841
Int. Cl.³ G03B *27/52*
U.S. Cl. 355—57 **9 Claims**



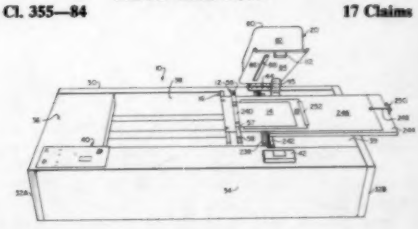
1. A variable magnification copying device having a copying optical system capable of enlarging and reducing the image of an original, comprising: full-speed mirror means for scanning a predetermined copying size document; a half-speed mirror following said full-speed mirror; a zoom lens system and means for moving said zoom lens system following said half-speed mirror wherein a region of movement of said zoom lens system for an enlargement copying operation is shared with a region of movement of said half-speed mirror for an equal magnification copying operation and a reduction copying operation.

4,420,249

IMAGE REPROPORTIONING MACHINE

Dennis H. Trump, Nashua, N.H., assignor to Nashua Control Instruments, Inc., Nashua, N.H.

Filed May 7, 1982, Ser. No. 376,028
Int. Cl.³ G03B *27/10*
U.S. Cl. 355—84 **17 Claims**



1. An image reproportioning system for reproducing an

image from an image bearing sheet onto a photosensitive sheet so that the scale of one dimension of the reproduced image can be changed relative to its other dimension, said system comprising:

a first sheet supporting member for supporting one of said sheets;

a second sheet supporting member for supporting the other of said sheets in substantial juxtaposition with said one sheet;

means for defining a slit of light;

means for moving said first and second sheet supporting members at a substantially constant speed in a first direction parallel to the direction of said one dimension and transverse to said slit of light so that said sheets pass through and are exposed by said slit of light;

means for moving said first and second sheet supporting members relative to one another at a substantially constant relative speed as said sheets are exposed to said slit of light, said relative speed being a function of the percentage of change of said scale of said one dimension, said means for moving said first and second sheet supporting members relative to one another including

(a) means for spring biasing said first and second members so that said second member is biased to move relative to said first member in a direction parallel to said first direction;

(b) ramp means;

(c) means for adjusting the angle of inclination or declination of said ramp means in said first direction; and

(d) cam arm means (1) pivotally mounted to and adapted to move with said first sheet member, and (2) cooperative with said ramp means so as to move said second member relative to said first member at a constant linear speed against said bias means as said first and second members move at said substantially constant speed.

4,420,250

ARRANGEMENT FOR MEASURING THE BATH LEVEL IN A CONTINUOUS CASTING APPARATUS

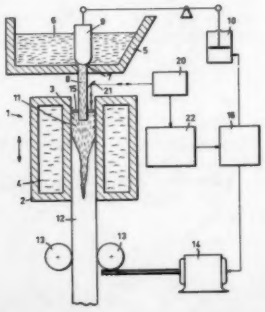
Günter Kompa, Schopfheim, Fed. Rep. of Germany, assignor to Endress u. Hauser GmbH u. Co., Maulburg, Fed. Rep. of Germany

Filed Jul. 25, 1980, Ser. No. 172,157

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1979, 2931199

Int. Cl.³ G01C *3/08;* **G01F** *23/00*

U.S. Cl. 356—5 **1 Claim**



1. A method for measuring the bath level in a cooled, tubular mould utilized in a continuous casting process where a melt of metal to be cast is discharged from a container therefor into the mould via an immersion tube vertically extending into a bore through the mould to thereby establish the bath, there being an annular space between the immersion tube and the wall of the bore, and where the melt is solidified by the cooled mould and continuously withdrawn therefrom as a solidified bar, said method comprising the steps of transmitting a series of light pulses from a transmission point in a first direction through an elongated tube horizontally disposed above the mould to the side thereof having a right-angle bend therein to a common deflecting mirror disposed at the bend; deflecting the light pulses from the common deflecting mirror into said annular space between the immersion tube and mould bore in a direction parallel to the vertically extending immersion tube and onto the surface of the bath; reflecting pulses from said bath surface through said annular space back to said common deflecting mirror; deflecting the reflected pulses from said mirror through said tube in a direction opposite to said first direction to a receiving point; electrically measuring the time interval between the instant of transmission of each transmitted light pulse and the instant of receipt of the corresponding echo light pulse to determine said bath level.

4,420,251

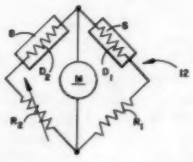
OPTICAL DEFORMATION SENSOR

Kenneth A. James, Corona del Mar; William H. Quick, La Habra Heights; Rudolf R. August, Laguna Beach, and Virgil H. Strahan, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 146,929, May 5, 1980, abandoned. This application Dec. 28, 1981, Ser. No. 334,998

Int. Cl.³ G01B *11/16;* **G01L** *1/24*

U.S. Cl. 356—32 **6 Claims**



1. An optical sensor to provide an indication of a physical parameter, said optical sensor comprising:

source means for providing a supply of incident light signals,

first optical means to polarize said incident light signals,

second optical means arranged so as to selectively transmit polarized light signals that are supplied thereto,

at least one light transmitting optical fiber aligned at a first end thereof with each of said first and second optical means for receiving polarized incident light signals from said first optical means,

light reflecting means aligned with the second end of said optical fiber to thereby reflect polarized light signals that are transmitted thereto via said optical fiber back through said optical fiber and to said second optical means, and

optical detector means aligned to receive polarized output light signals that are selectively transmitted from said optical fiber through said second optical means, said detector means being responsive to the optical characteristics of the output light signals,

said optical fiber undergoing a corresponding deformation in response to a physical parameter, whereby to alter the optical characteristics of the light signals being transmitted therethrough,

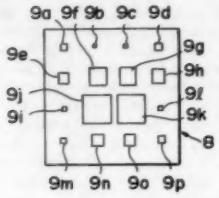
the optical characteristics of the output light signals that are transmitted to said optical detector means through said second optical means relative to the optical characteristics of the incident light signals supplied to said optical fiber from said first optical means providing an indication of the physical parameter.

4,420,252

LIGHT MEASURING DEVICE FOR CONTROLLING EXPOSURE

Kenji Nakauchi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 22, 1980, Ser. No. 218,561
Claims priority, application Japan, Dec. 21, 1979, 54-166690; Dec. 21, 1979, 54-166691
Int. Cl.³ G01J 1/30
U.S. Cl. 356—225 11 Claims



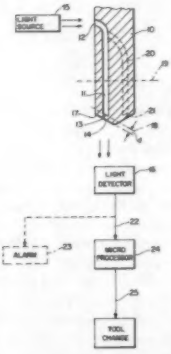
1. A light measuring device for measuring the brightness of a subject matter, comprising a plurality of photodetectors arranged to measure the brightness of different respective parts of the subject matter, weighting means for weighting the output of said photodetectors to different respective degrees according to the position of the photodetectors, and summing means receiving the weighted outputs of said photodetectors to provide an exposure output.

4,420,253

METHOD AND APPARATUS FOR DETECTING WEAR OR BREAKAGE OF TOOLS AND OTHER OBJECTS

Timothy R. Pryor, Tecumseh, Canada, assignor to Diffracto Ltd., Windsor, Canada

Filed Nov. 20, 1981, Ser. No. 323,397
Int. Cl.³ G01N 21/00; G02B 5/14; B23B 39/00
U.S. Cl. 356—237 14 Claims



1. A method of detecting wear or breakage of an object which comprises:

providing an object having an elongate fiber optic imbedded in the object such that a first, light receiving end of said fiber optic is located at a first surface of the object and such that a second, light emitting end of said fiber optic is located within the body of said object and spaced from a further surface of the object such that the light emitting end of said fiber optic is covered by a portion of said object overlying said light emitting end of said fiber optic;

directing light onto said light receiving end of said fiber optic whereby said light is transmitted along said fiber optic to the light emitting end thereof, said light being such that the portion of the object overlying said light emitting end of said fiber optic is opaque thereto; and,

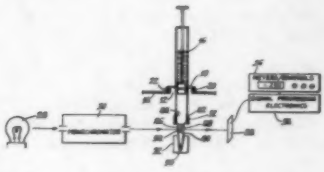
detecting any light emitted from said light emitting end of said fiber optic whereby the detection of emitted light provides an indication that the portion of said object overlying said light emitting end of said fiber optic is not present.

4,420,254

CUVET AND ASSOCIATED APPARATUS AND METHOD FOR USING SAME

John R. Smeaton, P.O. Box 337, Wayne, Ill. 60184

Filed Feb. 19, 1980, Ser. No. 122,376
Int. Cl.³ G01N 1/14
U.S. Cl. 356—246 13 Claims



1. The combination of:

a cuvet comprising a hollow body with first and second body portions, said first body portion having an opening and an associated coupling section for releasible connection thereof with a variable pressure device, and said second body portion having windows and a draw hole for receipt therethrough of a liquid to be drawn into the second body portion and in alignment with the windows;

a variable pressure device, said variable pressure device having a hollow body, means for varying the pressure within said hollow body and means releasibly coupling the hollow body with the cuvet opening;

a spectrophotometer; a cuvet holder; an access panel having an opening for receipt of the variable pressure device; and

a light shield, said variable pressure device extending through said opening, and said light shield substantially closing against light any gap between the variable pressure device and the sides of the opening.

4,420,255

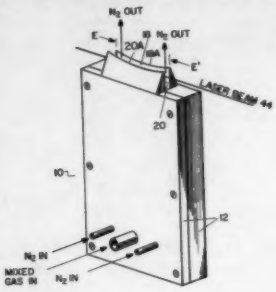
ADIABATIC BURNER FOR PREMIXED GASES

Mark A. DeWilde, Forest Hill, and Richard A. Beyer, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 16, 1981, Ser. No. 302,892
Int. Cl.³ G01J 3/30; G01N 21/72
U.S. Cl. 356—315 5 Claims

1. A method for optically probing the precombustion and primary reaction zones of an essentially adiabatic flame of a combustible gas mixture, which comprises introducing a stream of said gas mixture into a burner channel having an outlet including a pair of essentially parallel and coextensive walls each terminating in a knife edge, passing said gases through said channel under relatively laminar flow conditions, flaming said gas mixture exiting said outlet, and passing an optical probe between said outlet walls with knife edges

through said precombustion or primary reaction zones of a flame of said combustible gas mixture, said knife edges providing a stable, essentially adiabatic flame where the combustible gas mixture exits said outlet.



4,420,256

DUST MEASUREMENT

Gerdt Fladda, and Thorulf Pettersson, both of Täby, Sweden, assignors to Svenska Träforskningsinstitutet, Stockholm, Sweden

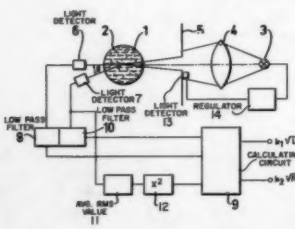
PCT No. PCT/SE80/00172, § 371 Date Feb. 12, 1981, § 102(e) Date Feb. 12, 1981, PCT Pub. No. WO80/02876, PCT Pub. Date Dec. 24, 1980

PCT Filed Jun. 13, 1980, Ser. No. 237,123

Claims priority, application Sweden, Jun. 15, 1979, 7905294

Int. Cl.³ G01N *15/02*

U.S. Cl. 356—336 **10 Claims**



1. Measuring apparatus for measuring the concentration of and/or average particle diameter of substantially spherical particles present in a flowing medium, comprising:

a light source for illuminating the particles with a light beam having an axis in a direction different from the direction of flow of the medium;

a first light detector, positioned along the axis of the light beam so as to receive light not scattered and not absorbed by the particles, for generating, responsive to the amount of light detected thereby, a first light detector signal having DC and AC components;

a second light detector, positioned not along the axis of light beam so as to only receive light reflected by the particles, for generating, responsive to the amount of light detected thereby, a second light detector signal having DC and AC components;

a first low pass filter, coupled to said second light detector, for filtering out the AC component of said second light detector signal and passing only the DC component thereof;

RMS circuit means, coupled to one of said first and second light detectors, for generating a signal related to the average RMS value of the AC component of the light detector signal received therefrom;

squaring circuit means, coupled to the RMS circuit means, for generating a signal related to the square of the average RMS value of the AC component coupled to said RMS circuit means; and

a calculating circuit, coupled to said squaring circuit means and to said first low pass filter for (a) generating a first signal L representing a logarithmic function of the DC voltage component of the output voltage from the second detector proportional to the concentration of the particles and inversely proportional to the average radius of the particles, (b) generating a signal R representing a logarithmic function of said squared average RMS value proportional to both the average radius of the particles and to the concentration of the particles, (c) generating a first signal $A=\sqrt{L \cdot R}$ proportional to the concentration and independent of the particle diameter when measuring the concentration, and (d) generating a second signal $B=\sqrt{R/L}$ proportional to the diameter of the particles and independent of their concentration when measuring the average particle diameter.

4,420,257

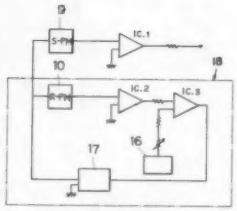
LASER LIGHT SCATTERING PHOTOMETER

Mitsutoshi Fukuda; Nobuyuki Baba, and Kenji Arichika, all of Nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Feb. 14, 1980, Ser. No. 121,314

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—341 **26 Claims**



12. An apparatus for measuring the intensity of light scattered by a test fluid comprising: means for providing a light beam, measuring cell means having a chamber accommodating test fluid, said measuring cell means including a body of non-light reflecting material having a central chamber, an inlet pathway open to one side of the chamber, and an outlet pathway open to the other side of said chamber, said chamber and inlet and outlet pathways accommodating flowing test fluid, glass block means secured to opposite sides of the body, said chamber being aligned with the optical axis of the light beam whereby the light beam passes through the test fluid in said chamber as transmitted light and scattered light, means having an annular slit located adjacent the measuring cell means aligned to match the axis of the scattered light, first light detector means operable to monitor the intensity of scattered light passing through said annular slit, second light detector means operable to monitor the intensity of the transmitted light, and electronic circuit means connected to said first and second light detector means operable to use variations of the intensity of the transmitted light to compensate for fluctuations of the intensity of the scattered light to provide an output related to the intensity of the scattered light, said circuit means having first means connected to the output of the second light detector means, reference voltage means connected to the first means, and power supply means connected to the output of the first means and the input of the first light detector means whereby variations of the scattered light are compensated by the varia-

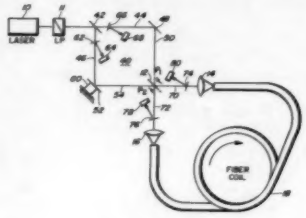
tions of the transmitted light detected by the second light detector means.

4,420,258

DUAL INPUT GYROSCOPE

William K. Burns, and Scott C. Rashleigh, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 23, 1981, Ser. No. 314,298
Int. Cl.³ G01C *19/64*; G01B *9/02*
U.S. Cl. 356—350 **15 Claims**



1. A Sagnac rotation measurement device designed to operate in a reciprocal mode for maximum sensitivity comprising:

an interferometer including a 3 dB coupler with two input ports and two output ports and a light path circuit with a plurality of turns of optical path in or parallel to a given plane and with the ends of the circuit connected between said two outputs ports of said 3 dB coupler,

means for applying different equal intensity light beams to each of said two input ports of said 3 dB coupler in appropriate phase relationship so that the light beams applied from each of said output ports into said light path circuit ends for counterpropagation therethrough have equal intensities; and

means for extracting output light signals returning from said light path circuit having information regarding the rotation rate of said plane of said light path circuit from the input ports of said 3 dB coupler.

4,420,259

DOUBLE COUPLED DUAL INPUT RATE SENSOR

Henry F. Taylor, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 23, 1981, Ser. No. 314,299
Int. Cl.³ G01C *19/64*; G01B *9/02*
U.S. Cl. 356—350 **8 Claims**

1. A rotation measurement device comprising:

a first optical path;

a second optical path;

means for directing equal intensity beams along said first and second optical paths, respectively;

phase shifting means for generating a relative phase shift between the light beams propagating in said first and said second optical paths;

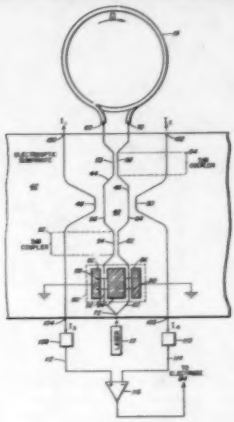
a first 3 dB coupler disposed in said first and second optical paths for coupling the light beams propagating therein;

a second 3 dB coupler disposed in said first and second optical paths following said first 3 dB coupler for coupling the light beams propagating therein;

a light path circuit having a plurality of turns in or parallel to a given plane with one end thereof connected to said first optical path through said second 3 dB coupler and with the other end thereof connected to said second optical path through said second 3 dB coupler such that light beams will propagate in mutually opposite directions in said light path circuit;

means disposed between said first and second 3 dB couplers for extracting a portion of the light signals propagating back from said light path circuit through said first and second light paths; and

means for comparing the intensities of said extracted light signals and generating a control voltage therefrom proportional to the difference in intensities thereof and applying this control voltage to control the phase shift gener-



ated by said phase shifting means in order to cause the difference in extracted intensities to go to zero;

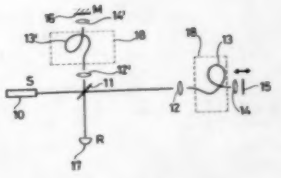
wherein this control voltage applied to said phase shifting means in order to the force the difference in extracted intensities to go to zero is proportional to the rotation rate in said plane of said light circuit path.

4,420,260

INTERFEROMETER TRANSMITTING THE USEFUL PHASE INFORMATION THROUGH OPTICAL FIBRES

Mario Martinelli, Suzzara, Italy, assignor to Cise - Centro Informazioni Studi Esperienze S.p.A., Milan, Italy

Filed May 4, 1982, Ser. No. 374,896
Claims priority, application Italy, May 6, 1981, 21529 A/81
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—351 **13 Claims**



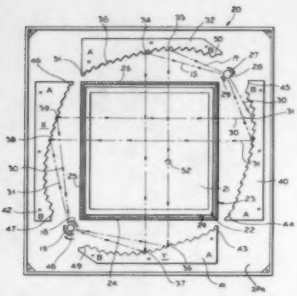
1. An optical-fibre interferometer with differential substraction of the noise collected by the optical-fibre transmission line, characterized in that it comprises a laser-light emitter which sends a beam of polarized light to the input end of a single-mode optical fibre, at the output end whereof a first beam splitter is provided which directs the two resultant beams onto a reference mirror and onto a device which produces a reflection of the beam with modulation of the optical phase to be detected, respectively, the two reflected beams coming from the device and the reference mirror being fed back through said first splitter to said output end of the optical fibre to form a composite beam sent from said input end of the optical fibre to a detecting element.

4,420,261

OPTICAL POSITION LOCATION APPARATUS

Gordon A. Barlow, Skokie; Timothy T. Tutt; Richard A. Karlin, both of Chicago, and John R. Krutsch, Glenview, all of Ill., assignors to Lowbar, Inc., Northbrook, Ill.

Filed Sep. 2, 1980, Ser. No. 183,357
Int. Cl.³ G01B 11/14; G02B 27/17, 5/00
U.S. Cl. 356—375 25 Claims



1. An optical position location and size determining apparatus for locating the positions of one or more objects along one or more coordinate axes of a defined sensing area, as well as for determining other measurable parameters of said one or more objects such as the sizes thereof relative to said one or more coordinate axes, said apparatus comprising:

radiant energy emission means;

radiant energy detection means;

means for distributing said radiant energy emitted by said radiant energy emission means over a location region from a position proximate to a first side of said region;

one or more integrated collector means proximate to a second side of said location region, said integrated collector means cooperating with said distributor means to receive said radiant energy distributed by said distributor means and to transmit said radiant energy to said radiant energy detection means;

signal output means operably connected to said radiant energy detection means;

shield means, said shield means to prevent ambient or stray radiant energy not transmitted from said integrated collector means from impinging said radiant energy detection means;

scanner means;

said scanner means including optical element means, said optical element means operating to direct said radiant energy received from said integrated collector means to said radiant energy detection means;

said scanner means further including motor means, said motor means being operably connected to said optical element means whereby said optical element means is made to rotate with respect to said integrated collector means;

said scanner means further including apertured mask means, said apertured mask means having a dimensioned aperture therein;

said apertured mask means cooperating with said optical element means and located in optical alignment with said optical element means and said radiant energy detection means;

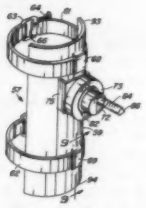
said shield means and said scanner means cooperating to restrict the radiant energy received by said radiant energy detection means to that portion of said distributed radiant energy received by the portion of said integrated collector means which is instantaneously in optical alignment with the combination of said rotating optical element means, said dimensioned aperture of said apertured mask means, and said radiant energy detection means, whereby the radiant energy received by said integrated collector means may be sequentially and selectively monitored by said radiant energy detection means.

4,420,262

APPARATUS FOR UTILIZING HAND-HELD POWER DRILL FOR SHAKING PAINT CONTAINERS AND THE LIKE

John W. Sterrenberg, 8350 E. McKellips Rd. #146, Scottsdale, Ariz. 85257

Continuation-in-part of Ser. No. 278,079, Jun. 29, 1981, abandoned, which is a division of Ser. No. 174,172, Jul. 31, 1980, Pat. No. 4,318,622. This application Jun. 14, 1982, Ser. No. 388,262
The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.
Int. Cl.³ B01F 11/00
U.S. Cl. 366—110 17 Claims



1. An apparatus utilized in conjunction with a hand-held power drill for shaking a container of spray paint, the hand-held power drill including a rotatable chuck, the container of spray paint having a longitudinal axis and a cylindrical side wall, said apparatus comprising in combination:

a. a base member;

b. securing means for securing said base member to the cylindrical side wall of said spray paint container;

c. a first cylindrical driveshaft rotatably mounted to said base member for movement about a first axis of rotation extending substantially perpendicular to the longitudinal axis of said spray paint container, said first cylindrical driveshaft having a front face substantially perpendicular to said first axis of rotation at an end of said first cylindrical driveshaft furthest from said spray paint container;

d. a second generally cylindrical driveshaft extending outwardly from the front face of said first cylindrical driveshaft by a distance substantially commensurate with the length of the rotatable chuck of the hand-held power drill, said second generally cylindrical driveshaft having a diameter smaller than the diameter of said first cylindrical driveshaft, said second generally cylindrical driveshaft having a first end secured to said first cylindrical driveshaft and having a second end for being engaged by the rotatable chuck of the hand-held power drill, said second generally cylindrical driveshaft having a second axis of rotation extending substantially perpendicular to said front face of said first cylindrical driveshaft and substantially parallel to said first axis of rotation, said second axis of rotation being offset from said first axis of rotation for allowing a user to vibrate said base member and said spray paint container secured thereto by operating the hand-held power drill to rotate said second generally cylindrical driveshaft while holding said spray paint container loosely in one of the user's hands.

4,420,263

ELECTRONIC WATCH WITH MEANS FOR DETECTING THE MOVEMENT OF A HAND THROUGH A REFERENCE POSITION

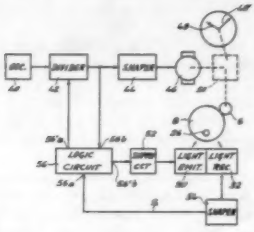
Rene Besson, Neuchatel, and Alphonse Bron, Bassecourt, both of Switzerland, assignors to ETA S.A., Fabriques d'Ebauches, Granges, Switzerland

Filed Dec. 15, 1982, Ser. No. 450,140

Claims priority, application Switzerland, Dec. 23, 1981, 8243/81

Int. Cl.³ G04C *3/00, 9/00;* **G04B** *23/02*

U.S. Cl. 368—80 **7 Claims**



1. An electronic watch comprising a frequency generator for supplying at least one periodic signal, stepping motor means controlled by said signal, at least one hand for displaying the time and performing p steps per revolution, a gear train for transmitting the movement of said motor means to said hand and means for detecting the movement of said hand through at least one reference position, comprising:

a movable detection member mounted pivotally about an axis and provided with a first optical device;

a movable drive member connected to said gear train and co-operating with said movable detection member in order successively to impart to said first optical device n separate angular positions per revolution of said movable detection member with $P>n\geqq 2$ and $P=k\times n$, k being an integer;

a second optical device which is fixed comprising at least means for emitting a light beam towards said movable detection member and light detecting means for receiving at least a part of said light beam only when said first optical means is in those of said n positions corresponding to said reference positions of said hand and for converting said light beam into an electrical signal; and

means for delivering a detection signal in response to said electrical signal.

4,420,264

STRUCTURE FOR PREVENTING THE ROTATING OF A REGISTER RING OF A DIVER'S WATCH

Toshio Murata, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1982, Ser. No. 416,562

Claims priority, application Japan, Sep. 18, 1981, 56-138533[U]; Jul. 9, 1982, 57-119588

Int. Cl.³ G04B *19/20, 39/00;* **G05G** *5/06;* **G09F** *9/00*

U.S. Cl. 368—223 **7 Claims**

1. A diver's watch comprising

a watch case;

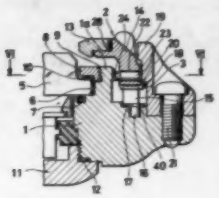
an annular upright portion formed on said watch case and having a plurality of lock notches disposed at the peripheral portion thereof, each of said lock notches being in the form of an axially extending groove;

a register ring rotatably and axially, movably provided at the outside of said upright portion of said watch case and having a plurality of notches at the underside thereof, each of said notches being in the form of a radially extending groove;

at least three elastic click members secured to said watch case, one end of each of said click members engaging with one of said notches and urging said register ring in the upward direction;

a holding ring disposed outside the register ring and secured to said watch case for holding said register ring;

a lock pin inwardly projected from said register ring and engaged with one of said lock notches; and



said lock notches and notches of said register ring corresponding with each other in the angular position of the register ring, wherein

said lock pin and lock notches are so arranged so that when said register ring is depressed against the elasticity of said click members, said lock pin disengages from the corresponding lock notch.

4,420,265

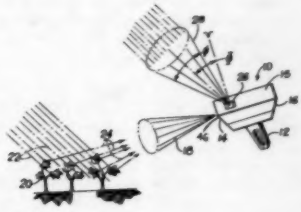
INFRARED TEMPERATURE MONITORING APPARATUS HAVING MEANS FOR SKY RADIATION COMPENSATION

Charles E. Everest, 11662 Pincian Way, Santa Ana, Calif. 92705, and Graham K. Walker, 168 B Suffolk St. West, Guelph, Ontario, Canada (N1H 2J8)

Filed Jul. 31, 1981, Ser. No. 289,003

Int. Cl.³ G01J *5/04, 5/06*

U.S. Cl. 374—133 **13 Claims**



1. An improved apparatus for measuring the temperature of an object using a first detector in a portable instrument for detecting the infrared radiation emanating therefrom, the improvement comprising:

a second detector in said portable instrument for detecting secondary infrared radiation emanating from a source other than said object, said secondary radiation being reflected by said object into said first detector,

means for adjusting the relative output signals produced by said first and second detectors, respectively, for providing a correction signal for calibration of the reflection characteristics of said reflected secondary radiation of said object,

means for combining said relative output signals with a reference signal to produce a composite signal having said correction signal, which is indicative of the temperature of said object and compensates for the reflection by said object of said secondary radiation, and

means for displaying a temperature value corresponding to said composite signal.

4,420,266

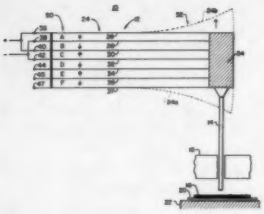
PIEZOELECTRIC PRINTER AND PIEZOELECTRIC MULTILAM ACTUATOR USED THEREIN

Henry H. Kolm, Wayland, and Eric A. Kolm, Brookline, both of Mass., assignors to Piezo Electric Products, Inc., Cambridge, Mass.

Division of Ser. No. 300,025, Sep. 8, 1981, Pat. No. 4,362,407. This application Aug. 23, 1982, Ser. No. 410,549

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **7 Claims**



1. A piezoelectric actuator comprising:

a piezoelectric multilam including at least two piezoelectric members and having a mounting portion and an actuating portion; said actuating portion being movable in an actuating direction and a cocking direction; said multilam being tapered in its lateral dimension, being larger at the mounting portion and smaller at the actuating portion;

a weight carried by said multilam for increasing the energy transfer of said multilam;

means for applying a cocking voltage and an actuating voltage to said members which voltages are less than the rupture voltage in the poling direction and less than the depoling voltage in the depoling direction for cocking and actuating said multilam, the duration of said cocking voltge being approximately the period of the resonant frequency of said multilam.

4,420,267

SERIAL PRINTER

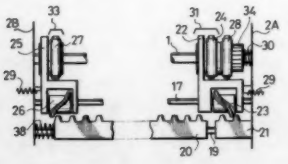
Yasuhiko Iwane, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 333,770

Claims priority, application Japan, Dec. 25, 1980, 55-184676

Int. Cl.³ B41J *1/50, 7/34*

U.S. Cl. 400—149 **13 Claims**



1. A serial printer having a plurality of carriages carrying respective type wheels and each adapted to be shifted to desired positions along a line to be printed, comprising:

(a) a first carriage adapted to be moved from a first reset position to various printing positions along a line to be printed, said first carriage rotatably carrying a first type wheel and rotatably carrying a first screw member having a spiralling tooth formed over at least a portion of its circumference;

(b) a second carriage adatped to be moved from a second reset position to various printing positions along a line to be printed, said second carriage rotatably carrying a second type wheel and rotatably carrying a second screw member having a spiralling tooth formed over at least one portion of its circumference;

(c) means including a type wheel drive shaft for rotating said first and second type wheels;

(d) means for rotatively driving said type wheel drive shaft;

(e) means including a screw member drive shaft for rotating said first and second screw members;

(f) means for rotatively driving said screw member drive shaft;

(g) a hammer member having a striking surface having a length corresponding to the printing area of one line of printing;

(h) means for driving said hammer member;

(i) said hammer member being unable to strike said first type wheel when said first carriage takes said first reset position;

(j) said hammer member being unable to strike said second type wheel when said second carriage takes said second reset position, said second reset position for said second carriage being located oppositely along the line to be printed from said first reset position for said first carriage; and

(k) an elongated rack adapted to be moved between two positions each causing said rack to engage a respective one of said first and second screw members, and means for sliding said rack longitudinally between said two positions so that said screw members may selectively be made to engage with the teeth of said rack thereby to shift the associated carriage.

4,420,268

PRINTING APPARATUS AND TAPE CLAMP THEREFOR

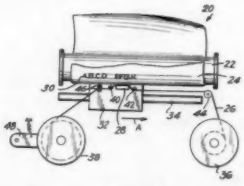
Yoshihiro Tsukamura, Kawasaki; Hidekuni Aizawa, Yokohama, and Keiichi Ohta, Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 329,701

Claims priority, application Japan, Dec. 11, 1980, 55-178143[U]

Int. Cl.³ B41J *33/14*

U.S. Cl. 400—233 **7 Claims**



1. Apparatus for producing visual information on recording paper in response to an information signal, comprising:

platen means associated with said recording paper;

recording head means adapted to move in a first direction relative to said paper during a recording operation for transferring a pigment from a tape positioned between said recording head means and said paper so as to record said visual information on said paper and adapted to move in a second direction relative to said paper during a return operation;

carriage means adapted to move with said recording head means in said first and second directions;

first tape clamp means for clamping said tape to said carriage means during movement of said recording head means in said second direction to withdraw an unused portion of

tape after said recording head means completes a recording operation with respect to said paper and including first lever means pivotally mounted to said carriage means, first restraining means secured to said carriage means, and first biasing means for biasing said first lever means toward said first restraining means to clamp said tape therebetween; and

second tape clamp means for clamping said tape to the apparatus during movment of said recording head means in said first direction to prevent movement of said tape during said recording operation and including second lever means pivotally mounted to said apparatus, second restraining means secured to said apparatus, and second biasing means for biasing said second lever means in said first direction toward said second restraining means to clamp said tape therebetween with a force which increases with an increasing force tending to pull the tape in the first direction.

4,420,269

DEVICE FOR LIFTING THE PRINTING HEAD OFF THE PLATEN

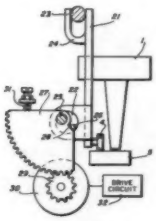
Rolf Ackermann, Nuremberg; Friedrich Jung, Erlangen; Egon Mauer, Furth, and Hermann Rupertinger, Oberasbach, all of Fed. Rep. of Germany, assignors to Triumph-Adler A.G. fur Buro- und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed Feb. 11, 1982, Ser. No. 348,090

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112079

Int. Cl.³ B41J *11/20*

U.S. Cl. 400—356 **1 Claim**



1. In a printer having a platen, a pair of frame supported guide rods extending parallel to said platen, and a carriage supporting a printing element,

means mounting said carriage on said guide rods for movement along said platen and for movement transverse to said platen,

one of said guide rods being eccentrically rotatably supported whereby rotation thereof will move said carriage away from engagement with said platen,

means on said carriage normally engaging said platen to establish a normal distance between said printing element and said platen,

a bidirectional stepper motor,

drive circuitry for energizing said motor to effect movement of said carriage away from and back into engagement with said platen to facilitate paper movement between said printing element and said platen during the time said carriage is away from engagement with said platen,

means driven by said motor for moving said carriage to a first position away from engagement with said platen and to a second position further away from engagement with said platen when said motor is energized in response to a line feed signal and to a paper insertion signal, respectively,

said means driven by said motor for moving said carriage comprising,

a gear segment rotatably mounted on the rotational support of said eccentrically supported guide rod,

a pinion gear on said motor for driving said gear segment,

a drive surface on said gear segment, and

an eccentric pin extending axially from the end of said eccentrically supported guide rod in the path of said drive surface to be driven thereby and to thereby rotate said eccentrically supported guide rod.

4,420,270

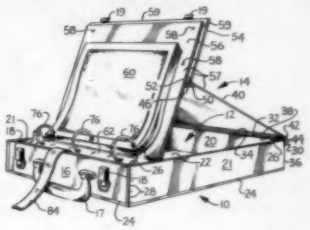
VISUAL DISPLAY PRESENTATION BOX

Henry S. Rossello, Mission Viejo, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Sep. 24, 1982, Ser. No. 423,294

Int. Cl.³ A45C *3/02*

U.S. Cl. 402—76 **8 Claims**



1. A portfolio for housing, carrying, and displaying visual presentation materials including:

a rear wall portion; and

a lid portion, said lid portion having:

a forward lid section;

an aft lid section;

first hinge means attaching said aft lid section to said rear wall portion;

second hinge means attaching said forward lid section to said aft lid section;

a display plate attached to said forward lid section;

means for attaching the visual presentation material to said display plate; and

a bottom portion connected to said rear wall portion, said aft lid section having a closed position generally parallel to said bottom portion and an open position at a first predetermined angle to said bottom portion, said forward lid section having a closed position generally parallel to said bottom portion and an open position at a second predetermined angle to said bottom portion greater than said first predetermined angle, said display plate being attached to, and parallel to, said forward lid section and including:

a first edge positioned to be supported on said bottom portion when said forward lid section with said attached display plate are in the open position, said display plate forming a third predetermined angle with said bottom portion.

4,420,271

CENTERLINE-ATTACHED LOOSELEAF NOTEBOOK PAGE LIFTER

Ray F. Zabielski, P.O. Box 92, Roaring Springs, Tex. 79256

Continuation-in-part of Ser. No. 195,758, Oct. 10, 1980, Pat. No. 4,373,825. This application Sep. 14, 1982, Ser. No. 417,887

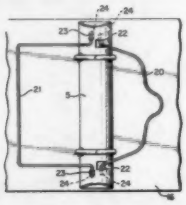
The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.³ B24F *13/00*

U.S. Cl. 402—80 L **10 Claims**

1. A page lifting device for use with a looseleaf binder having front and back covers, binding rings and a ring base cover which comprises at least one pair of stiff wire loops rotatably

mounted on the top of the ring base cover by a hinge means at or contiguous with the centerline of said ring base cover, said loops being mounted perpendicular to and surrounding at least one of the binding rings and being of sufficient height to freely pass over the binding rings; whereby on closing the looseleaf binder the outermost parts of said loops encounter the inside surfaces of the looseleaf binder's front and back covers, forcing said loops toward the center of said binder and thus forcing the sides of said loops to encounter the bottom edges of any pages contained in said binder, thereby forcing said pages to rise on the binding rings away from the ring base cover toward the uppermost part of said binding rings preventing the pages from being caught between the binding rings and the inside surfaces



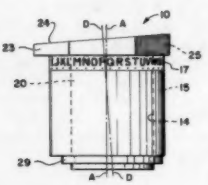
of the looseleaf binder's front and back covers; wherein the hinge means by which the stiff wire loops are attached to the top of the ring base cover comprises the ring base cover having at least two raised sections formed in the surface thereof, at least one end face of each raised section having a means for receiving the end of at least one of said pair of stiff wire loops, and each of said pair of stiff wire loops having their ends angled to lie parallel to the ring base cover; the raised sections in ring base cover and the means for receiving the end of at least one stiff wire loop being located and being of sufficient size to allow the angled ends of the stiff wire loops to be placed therein, rotatably attaching the stiff wire loops to the ring base cover.

4,420,272

METHOD AND STRUCTURE FOR BEARING THE ECCENTRICITY OF A BUSHING BORE

William E. Ingalls, Longmont, and Thomas W. O'Rourke, Boulder, both of Colo.

Filed Sep. 27, 1982, Ser. No. 423,894
Int. Cl.³ F16D *1/00*
U.S. Cl. 403—4 **11 Claims**



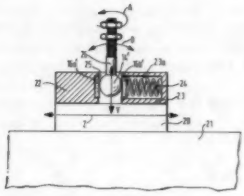
1. A bushing assembly having an infinitely variable eccentricity within a given range, the bushing assembly comprising:
an outer body member having an outer body surface defined around a first axis, and an inner bore defined therethrough around a second axis eccentric to the first axis; and
an inner sleeve member having an outer surface complementary in shape to the outer body member inner bore and defined around a third axis, and having an inner bore defined therethrough around a fourth axis eccentric to the third axis, the inner sleeve member being rotatably positioned within the bore of the outer body member, and at least one pair of the outer body pair of axis and inner sleeve pair of axis being in a skewed relationship;
whereby the eccentricity of the inner sleeve member bore relative to the outer body member outer surface may be varied by rotating the inner sleeve member within the outer body member.

4,420,273

COUPLING DEVICE FOR THE PLAY-FREE CONNECTION OF A PRECISION POTENTIOMETER WITH A MOVABLE MACHINE PART

Fritz Blessing, Ostfildern; Gabor Margitics, Esslingen, and Gerhard Brauer, Geltendorf, all of Fed. Rep. of Germany, assignors to Firma Novotechnik KG Offterdinger GmbH & Co., Ostfildern, Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 318,111
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1980, 3041639; Oct. 21, 1981, 3141655
Int. Cl.³ F16D *1/00, 3/00*
U.S. Cl. 403—24 **9 Claims**



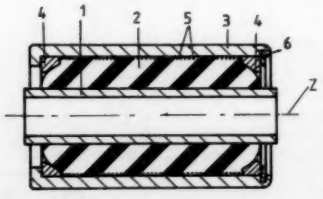
1. A coupling device for coupling a movable member of a machine to a movable member of a potentiometer to convert sliding movement of the movable member into proportional movement of the potentiometer comprising:
a ball-shaped glide adapted to be attached to one of said movable members;
a planar abutment engaging said glide and adapted to be attached to said other movable member, and
a biasing spring means for applying pressure, in a working direction, to said glide piece to maintain said glide piece and said planar abutment in intimate contact with one another, thereby forming a joint connection for the transmission of only translational movement.

4,420,274

ELASTIC ARTICULATION, COUPLING OR THE LIKE

Bruno Hüsch, Bad Neuenahr-Ahrweiler, Fed. Rep. of Germany, assignor to Boge GmbH, Eitorf, Fed. Rep. of Germany

Filed Feb. 5, 1981, Ser. No. 231,724
Int. Cl.³ F16B *1/00*
U.S. Cl. 403—227 **12 Claims**



1. An elastic articulated coupling comprising a relatively rigid inner member having a longitudinal axis, a relatively rigid outer member having a generally cylindrical interior surrounding said inner member with substantial clearance, an elasto-

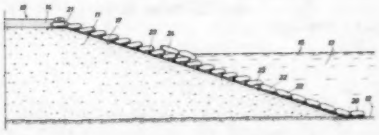
meric body located in the clearance between the inner and outer members, said elastomeric body being connected firmly to said inner member and being in frictional engagement at its outer peripheral surface with the outer member, said elastomeric body having relatively rigid annular end members at its ends for movement independently of and relative to said inner member, means acting against said end members and axially compressing and clamping said elastomeric body, and a wire mesh fabric of a solid material embedded in the outer peripheral surface of the elastomeric body, the wire mesh of the fabric running generally diagonally to the axis of axial compression and clamping, and the fabric being clamped with the elastomeric body by said clamping means.

4,420,275

ALASKAN OFFSHORE DRILLING BASE

John R. Ruser, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 19, 1982, Ser. No. 369,715
Int. Cl.³ E02B *17/00, 3/12*
U.S. Cl. 405—217 **1 Claim**



1. An offshore man-made island of a size to drill oil or gas wells therefrom, said island, when taken in vertical cross section, being in the form of a truncated cone having a base at least four times as great as its height, at least the sloping outer surfaces of the island being made of sand and gravel of a size that is subject to erosion by wave action, said island comprising:

a protective erosion-combating covering on the sloping sides of the island in the form of a porous flexible sheet through which water can pass in either direction with minimal disturbance to the sand and gravel forming the island;

said covering extending from the bottom of the island on the ocean floor upwardly along the sides of the island to a level at least equal to that of maximum high tide, said covering comprising a plurality of lengths of flexible sheet material positioned on the sloping sides of the island and extending radially outwardly and downwardly from the top to the bottom of said island;

anchoring means in the form of partially flexible bags of sand and gravel arranged in a pattern to cover the flexible island covering from the ocean floor to a level at least equal to that of maximum high tide;

each of said bags having sides longer than the width of its bottom, said bags being arranged on their sides in rows on the slope of the island with the long dimension of the bags running up the side of the island; and

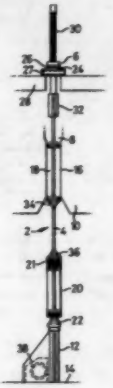
the bags located between the high and low water levels on the island arranged in an imbricated manner with the downslope end of each bag overlapping and anchoring the upslope end of the adjacent bag lying downhill thereof by extending from 20 to 60 percent of the length of the bags over the adjacent downhill bags.

4,420,276

BEARING ASSEMBLY FOR A TETHERED BUOYANT PLATFORM

Roy G. Roberts, Harrow, England, assignor to The British Petroleum Company Limited, London, England

Filed Apr. 28, 1981, Ser. No. 258,533
Claims priority, application United Kingdom, Apr. 24, 1980, 80/13564
Int. Cl.³ E02D *5/54;* **B63B** *21/50*
U.S. Cl. 405—224 **8 Claims**



1. A tether assembly for a tethered buoyant platform, suitable for installation in a shaft of a leg of the tethered buoyant platform, comprising a cable tether having a terminal at the end thereof for connecting to a corresponding member on the sea bed and having located at a position along its length

(a) a bearing to contact the sides of the shaft to transmit lateral forces from the tether to the shaft of the tethered buoyant platform and

(b) a bending guide, the bearing and the bending guide being provided by a member of generally cylindrical form adapted to be a sliding fit in the shaft of the leg and having an aperture extending lengthwise therethrough, the wall of the lower end of the aperture having a curved surface to control the bending radius of the tether.

4,420,277

MINE ROOF DRILLER-BOLTER APPARATUS AND METHOD

George A. Hibbard; Ward D. Morrison, and Ralph C. Lumbra, all of Claremont, N.H., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Sep. 18, 1981, Ser. No. 303,328
Int. Cl.³ E21D *20/02*
U.S. Cl. 405—260 **41 Claims**

29. A method of bolting the roof of an underground mine, comprising the steps of:

stinging a housing against the roof of the underground mine,

moving a peripheral end of a drill centralizer into communication with the roof,

moving a drill rod with a drill bit attached to the end thereof, through a central bore of the drill centralizer and into the roof,

retracting the drill rod such that the drill bit is at a position rearward of a passageway communicating with the central bore of the centralizer,

without retracting the drill centralizer from communication with the roof, delivering a container of roof bolt anchoring media through the passageway and through the centralizer and into the drilled hole,

retracting the drill centralizer and moving the housing such

that the drill rod is moved out of alignment with the drilled hole as a roof bolt is moved substantially simultaneously into alignment with the drilled hole,

said roof bolt having the bolt head in a sleeve and the end of the bolt opposite the bolt head loosely disposed through an aperture in a bolt plate, said bolt and plate provided in a bolt plate centralizer by moving the loosely disposed

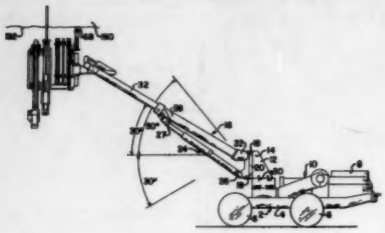


plate toward an opening in a generally planar bar of a bolt plate centralizer having wall segments extending outwardly and upwardly of the base, such that the plate passes over the wall segments adjacent the opening and impacts consecutively against the wall segments opposite the opening,

driving the roof bolt into the drilled hole, and setting the anchoring media around the roof bolt.

4,420,278

HEADING SHIELD

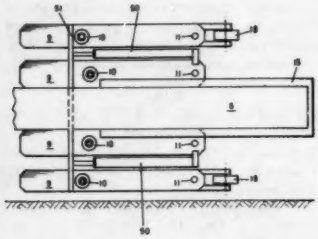
Andrew J. Walker, Tewkesbury, England, and John C. Watt, Johannesburg, South Africa, assignors to Dowty (South Africa) (Proprietary) Limited, South Africa

Filed Feb. 17, 1981, Ser. No. 234,745

Claims priority, application South Africa, Feb. 29, 1980, 80/1171; Aug. 8, 1980, 80/4838

Int. Cl.³ E21D *23/00*; E21C *29/00*

U.S. Cl. 405—301 **12 Claims**



1. A mobile mine conveying and support apparatus for protecting a separate continuous mining machine and collecting material mined by said machine, said apparatus comprising:

(a) a first portable mine roof support means, said means having;

(i) at least two longitudinal roof beams generally parallel to one another to engage the mine roof,

(ii) at least two longitudinal base support means mounted below said roof support beams to engage the mine floor,

(iii) at least two hydraulic pistons mounted therebetween for intermittently urging said roof beams into engagement with a mine roof,

(b) a second portable mine roof support means, said means having;

(i) at least two longitudinal roof beams generally parallel to one another to engage the mine roof adjacent the roof beams of said first support beams,

(ii) at least two longitudinal base support means mounted below said roof support means to engage the mine floor adjacent the longitudinal base support means of the first support means,

(iii) at least two hydraulic pistons for intermittently urging said roof beams into engagement with said roof when said roof is not supported by said first support means,

(c) the innermost longitudinal base support means of said first and second support means defining therebetween an operating space for a continuous mining machine;

(d) hydraulic advancing means for linking said first and second portable roof support means to advance each of said support means when its respective roof beams are withdrawn from engagement with said mine roof;

(e) conveyor means mounted between the inner most longitudinal base support means of said first and second mine roof support means for collecting and conveying material mined by said continuous mining machine;

whereby said portable roof support means is advanced intermittently forward by said hydraulic advancing means to protect an operator of a separate continuous mining machine that is advanced forward in a continuous manner.

4,420,279

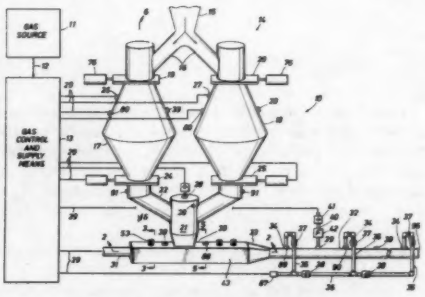
PRESSURE IMPULSE DENSE PHASE CONVEYING APPARATUS AND METHOD

Othel D. Easley, Jr., Houston, Tex., assignor to Reactor Services International, Inc., Alvin, Tex.

Filed Feb. 22, 1982, Ser. No. 351,196

Int. Cl.³ B65G *53/66*

U.S. Cl. 406—14 **24 Claims**



1. A fluid material slug conveying apparatus comprising:

(i) a source of motive fluid;

(ii) a motive fluid controlling and supplying means connected to the motive fluid source for supplying motive fluid at required pressures, quantities, positions and times;

(iii) a fluid material supply means for supplying a continuous source of fluid material to be conveyed by the motive fluid;

(iv) a slug forming and loading means for forming and loading slugs of fluid material comprising a slug forming and loading housing having a slug forming and loading motive fluid inlet at its upstream end, said slug forming and loading motive fluid inlet attached to and supplied by the motive fluid controlling and supplying means, the housing having a slug forming and loading venturi therein downstream of the slug forming and loading motive fluid inlet, the slug forming and loading venturi having a fluid material opening in the throat of the venturi, said fluid material opening being connected to and allowing open communication between the fluid material supply means and the throat section of the slug forming and loading venturi, a flutter valve comprising a piece of flexible material at-

tached at one end to the inside of the housing, upstream of the fluid material opening, of a length and a width such that when extended downstream and pressed against the fluid material opening it essentially covers said fluid material opening;

(v) a conveying tube having its upstream end attached to and in open communication with the downstream end of the slug forming and loading housing and having its downstream end in communication with and directed to the fluid material slug's destination.

4,420,280

TOOL BLOCK

Manfred Gustafson, Fagersta, Sweden, assignor to Seco Tools Aktiebolag, Fagersta, Sweden

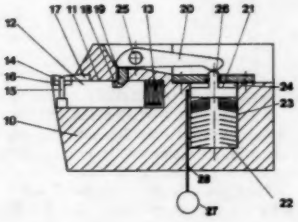
PCT No. PCT/SE81/00094, § 371 Date Aug. 11, 1981, § 102(e) Date Aug. 11, 1981, PCT Pub. No. WO81/03635, PCT Pub. Date Dec. 24, 1981

PCT Filed Mar. 27, 1981, Ser. No. 293,216

Claims priority, application Sweden, Apr. 3, 1980, 8002581

Int. Cl.³ B26D *1/00*

U.S. Cl. 407—109 **10 Claims**



1. In combination:

a tool block having a stop surface,

a cutting insert holder movable on said tool block between clamping and non-clamping positions, said holder including means for mounting a cutting insert such that the insert is clamped against said stop surface when said tool holder is in said clamping position, and

holder moving means for moving said insert holder into said clamping position and comprising:

a lever having first and second portions and being rotatably mounted on said tool block intermediate said first and second portions,

holder-engaging means at said first portion of said lever for engaging said holder and moving said holder to said clamping position in response to rotation of said lever in a first direction,

biasing means arranged on said tool block for forcefully engaging said second portion of said lever to rotate said lever in said first direction so that said holder-engaging means moves said holder to said clamping position, and

retracting means for retracting said biasing means to enable said lever to be rotated in a second direction opposite said first direction such that said holder is movable to said non-clamping position.

4,420,281

FAIL-SAFE MECHANISM

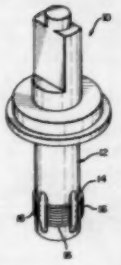
Robert E. Dehoff, Mt. Joy, Pa., assignor to AMP, Incorporated, Harrisburg, Pa.

Filed Oct. 5, 1981, Ser. No. 308,766

Int. Cl.³ F16B *35/02*

U.S. Cl. 411—392 **1 Claim**

1. An improvement to a threaded member capable of preventing damage to the threaded member by excessive rotational forces being applied thereto when the member is being advanced in a complementary threaded female member, said member being of the type having a shank with a free end at one end and means for applying rotational force at another end, the improvement characterized in that the threads extend over a limited portion of the shank, terminating above the free end and below the other end, and with the shank being hollow and axially slotted throughout the length of and for a distance on each side of the threaded portion to define a plurality of resilient, axially extending threaded segments which include non-threaded portions extending above and below the threaded



portion, said threaded segments and axial slots terminating above the free end, so that when the shank, under continual rotational force, becomes immobile, said segments are capable of recoverably collapsing inwardly whereupon the threads thereon become momentarily disengaged from the threads in the complementary member and the position of the shank relative to the complementary member shifts to permit the shank to be turned again whereupon the segments again recoverably collapse.

4,420,282

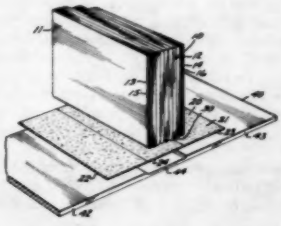
METHOD FOR BINDING BOOKS

Herbert R. Axelrod, Deal, N.J., assignor to Permatek, Inc., Las Vegas, Nev.

Filed Apr. 30, 1980, Ser. No. 145,018

Int. Cl.³ B42C *9/00, 19/04*

U.S. Cl. 412—4 **20 Claims**



1. A method for binding books comprising the steps:

assembling a plurality of pages into a stack having front and rear outer pages with one edge of the stack forming a spine and each page having height and width dimensions,

coating said spine with a flowable heat-activated glue,

providing a reinforcing short cover having inside and outside surfaces, the short cover defining a central portion to overlie said spine and side portions to at least partially overlie said outer pages,

coating the inside surface of said central and side portions of said short cover with a heat-activatable glue,

pressing said glue-coated spine against said heat-activatable glue-coated central portion of said short cover and heating and activating the glue on said central portion for adhering said central portion to said spine,

folding said side portions of the short cover to at least partially overlie said outer pages,

pressing each side portion of the short cover against an adjacent outer page and applying heat thereto, thereby activating said glue on said side portions and adhering them to said outer pages respectively.

4,420,283

METHOD OF FORMING AN OUTWARDLY INVERTED PERIPHERAL EDGE ON A PREFORMED METAL LID

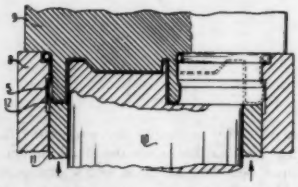
Willem P. Post, Diepenveen, Netherlands, assignor to Thomassen & Drijver-Verblifa N.V., Deventer, Netherlands

Filed Sep. 23, 1981, Ser. No. 304,646

Claims priority, application Netherlands, Sep. 29, 1980, 8005402

Int. Cl.³ B21D *51/26*

U.S. Cl. 413—8 **1 Claim**



1. The method of forming a metal lid to close, circular tolerances, which comprises the steps of:

(a) forming a metal lid having an outer annular wall portion which is concentric with an axis which is perpendicular to the general plane of the lid, having an inner annular wall portion spaced radially inwardly from and parallel to said outer wall portion, having a U-shaped portion joining said wall portions at one end thereof, and having a central disc-like portion bridging across the other end of said inner wall portion;

(b) closely confining the metal lid of step (a) within a die assembly to preserve the concentricity of said wall portions and their parallelism and to provide clearance spaces only in a region circumferentially surrounding a portion of said outer wall portion at its juncture with said U-shaped portion and in a region between said wall portions opposite said U-shaped portions and, while the metal lid is so confined;

(c) permanently deforming said U-shaped portion to close said clearance opposite thereto and to bulge and permanently deform said portion of the outer wall portion into said circumferentially surrounding clearance therefor; and then

(d) removing the so-deformed metal lid without further deformation to recover a finished metal lid having the circularity of the lid as formed in step (a).

4,420,284

DEVICE FOR THE FEEDING OF MATERIAL BARS FOR PROCESSING MACHINES

Hans Eisinger, Kopernikusstrasse 40, D-8900 Augsburg 21, Fed. Rep. of Germany, and Quido Kraus, Hirblingen, Fed. Rep. of Germany, assignors to Hans Eisinger, Augsburg, Fed. Rep. of Germany

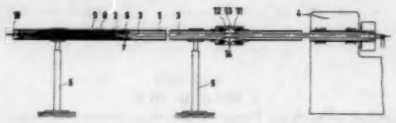
Filed May 22, 1979, Ser. No. 41,381

Claims priority, application Fed. Rep. of Germany, May 24, 1978, 2822569

Int. Cl.³ B22Q *5/22*

U.S. Cl. 414—17 **9 Claims**

1. A device for feeding bars of material to processing machines, comprising a tube in which a bar of material can be axially advanced in the direction of the processing machine, a piston guided in the tube over a substantial length thereof for applying axial pressure against the bar of material, a bellows, adapted to be loaded by a pressurizing medium, located behind the piston for applying pressure to the piston, the piston being hollow and the loading bellows being located within it when collapsed, pressure valve means for controlling the pressure of the pressurizing medium applied to the bellows for controlling



the feeding force of the piston acting on the bar material, a tubular diaphragm, loaded by the pressurizing medium, located in the tube and supported in a rotatable manner, whereby the bar of material can be centered, the inside diameter of the diaphragm which is not loaded by the pressurizing medium being equal to or greater than the inside diameter of the tube.

4,420,285

APPARATUS FOR LOADING BULK MATERIALS FROM A STORAGE BIN INTO A TRUCK

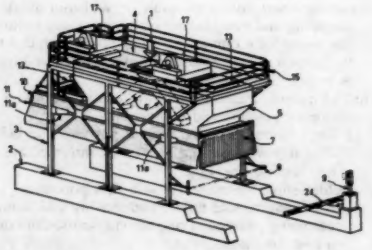
Georges Loyer, Viviers; Jean Bonnet, Carry-le-Rouet, and Roger Lazzarini, Marseille, all of France, assignors to La-Farge Conseils et Etudes, Paris, France

Filed Dec. 31, 1981, Ser. No. 336,303

Claims priority, application France, Jan. 5, 1981, 81 00056

Int. Cl.³ B65G *67/06*

U.S. Cl. 414—291 **4 Claims**



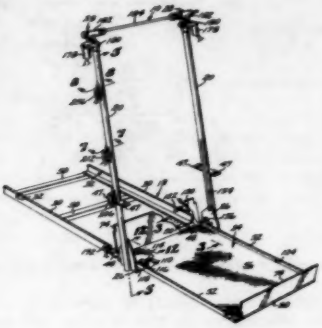
1. Apparatus for loading bulk materials from a storage unit into the body of a truck, said apparatus comprising a fluidtight ceiling supporting a hood, the lower part of said hood being heigher than the maximum higher of trucks to be loaded, the width and length of said hood being at least that of bodies of trucks to be loaded, said hood accommodating a chute for discharging bulk materials into the truck body to be loaded, means connected to said hood for exhausting air from under said roof, flexible movable wall means downwardly extending from walls of said hood and cooperable with sides or edges of the truck body to be loaded, said flexible movable wall means defining an enclosure, at least three said movable walls means being horizontally displaceable toward corresponding lateral and transverse sides of the truck body to be loaded, said means for exhausting air being powerful enough to urge said movable wall means into substantially fluidtight contact at corners of said enclosure against sides or edges of the truck body to be loaded.

4,420,286

INVALID LIFT APPARATUS

James M. Hanson, Garden Grove, and Robert Schlichting, Cerritos, both of Calif., assignors to Wide One Corporation, Anaheim, Calif.

Filed Mar. 27, 1981, Ser. No. 248,250
Int. Cl.³ B60P 1/44
U.S. Cl. 414—539 11 Claims



1. Invalid lift apparatus in combination with a passenger vehicle having a loading floor, and a door opening adjoining said loading floor, said apparatus comprising:

storage receptacle means located below said loading floor;

a generally horizontally oriented platform receivable within and supported by said receptacle means in an inner position wherein said platform projects outwardly of said loading floor and defines a step located inwardly of said door opening for ambulatory persons to step up to and down from said loading floor, said platform being movable outwardly of said doorway, into an outer position and out of engagement with said receptacle means, for subsequent lowering into a lower position wherein a wheelchair can be rolled onto or off said platform, and wherein said platform defines a step extending outwardly of said door opening for ambulatory persons to step up to or down from said loading floor when there is no wheelchair on said platform;

a pair of elongated, generally vertically oriented fixed support means attached to said structure on opposite sides of said door opening, respectively, and extending upwardly above the top of said door opening;

a pair of movable support means carried by said fixed support means, respectively, for vertical movement relative to said fixed support means, and including a pair of support bracket means for engaging and supporting said platform in said outer position;

a pair of actuator means carried by the upper extremities of said pair of fixed support means and mechanically coupled to the upper extremities of said pair of movable support means, respectively, and each operative to develop a torque to effect said vertical movement of the associated one of said pair of movable support means for raising and lowering said platform between said lower position and an upper position level with said loading floor for transferring a wheelchair between said platform and said loading floor; and

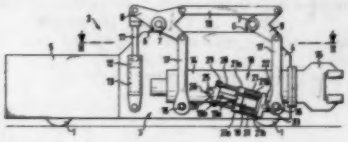
coupling means including a shaft connected to said pair of actuator means, and operative to mechanically transmit said torque developed by each of said pair of actuator means to the other of said pair of actuator means to thereby equalize the vertical movements of said pair of movable support means, said shaft extending transversely above the top of said doorway.

4,420,287

GRIPPER FEED AND GRIPPER RESILIENCE CYLINDERS ON FORGING MANIPULATORS

Erwin Kost, Meerbusch, and Werner Folta, Mettmann, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed May 5, 1981, Ser. No. 260,770
Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3019971
Int. Cl.³ B21J 13/10
U.S. Cl. 414—729 6 Claims



1. In a forging manipulator including a manipulator truck, a gripper support, a front suspension link and a rear suspension link which pivotably support the gripper support for relative longitudinal movement on the truck, and hydraulic cylinder means mounted to act between the truck and the gripper support for providing cushioning for longitudinal relative movement of said gripper support with respect to said truck, the improvement wherein the hydraulic cylinder means comprises a double acting movable assembly of three parallel spaced cylinders to form said assembly with a separate and independent middle cylinder and two separate and independent outer cylinders, respective pistons slidable in said cylinders, and respective separate and independent piston rods connected to said pistons, means to interconnect the piston rods of said two outer cylinders, means to pivotably connect said interconnecting means to one of the truck and the gripper support, and means to connect the piston rod of said middle cylinder pivotably to the other of the truck and the gripper support, so that when said middle piston and cylinder are operated during forward motion of the manipulator into forging position to produce a relative stroke of the middle piston and piston rod with respect to said middle cylinder, said outer interconnected piston rods and pistons are hydraulically biased in their retracted position to prevent relative motion between them and said respective outer cylinders, and when said outer piston rods and pistons are operated to produce relative motion thereof with respect to their outer cylinders toward their fully extended position, said middle piston is hydraulically biased in its fully extended position.

4,420,288

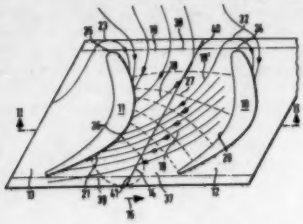
DEVICE FOR THE REDUCTION OF SECONDARY LOSSES IN A BLADED FLOW DUCT

Hans Bischoff, Gröbenzell, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 18, 1981, Ser. No. 275,037
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023466
Int. Cl.³ F01D 9/00
U.S. Cl. 416—244 A 5 Claims

1. An arrangement for the reduction of secondary flow losses in a bladed flow duct of a turbomachine having a plurality of turbine blades arranged circumferentially therearound along a circumferential direction, with each turbine blade being mounted upon a separate platform, and each turbine blade having opposite convex and concave sides, with the concave side defining a pressure side of the blade and the convex side defining a suction side of the blade, such that the convex suction side of each turbine blade faces a concave pressure side of an adjacent blade, and the concave pressure

side of each turbine blade faces a convex suction of an adjacent blade, said bladed flow duct defining a duct wall having a boundary layer step between circumferentially adjacent blades, said boundary layer step being directed towards the concave pressure side of an adjacent turbine blade, said boundary layer step extending obliquely, relative to said circumferential direction, in a direction along a approximately parallel with the suction side of the blade, and the boundary layer step in the longitudinal direction thereof having a convex shape and having a zero height at the beginning and at the end thereof.

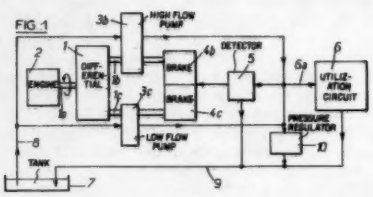


4,420,289

SYSTEM FOR SUCCESSIVELY PRODUCING HYDRAULIC FLUID FLOWS AT STAGGERED VALUES

Jean-Max M. Silhouette, Melun, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", Paris, France

Filed Jun. 15, 1981, Ser. No. 273,686
Claims priority, application France, Jun. 19, 1980, 80 13581
Int. Cl.³ F04B 49/00
U.S. Cl. 417—216 **10 Claims**



1. A system for successively producing hydraulic fluid flows at staggered values, said system comprising:

a single engine;

a mechanical transmission having at least two output shafts and at least one epicycloidal differential, one said at least one differential having an intake axis coupled to said engine;

a hydraulic fluid tank;

at least two rotary pumps having staggered nominal flow values, each of said pumps having mechanical intakes coupled by mechanical links to one of said output shafts of said transmission, fluid intakes connected to said fluid tank and fluid outputs;

brake means connected to each of said pumps;

means for successively controlling each of said brake means, said means for controlling including pressure detector means for determining the pressure of fluid at the discharge side of said pumps,

whereby each of said pumps is successively switched between stopping and running as a function of a threshold differential pressure; and

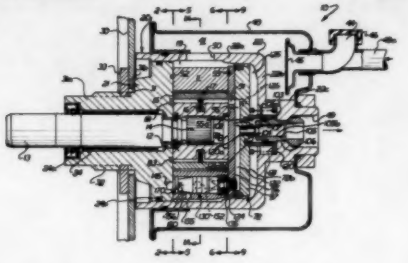
fluid circuits connecting said pumps to said pressure detector means.

4,420,290

POWER STEERING PUMP

Gilbert H. Drutchas, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed May 7, 1981, Ser. No. 261,645
Int. Cl.³ F04B 49/08
U.S. Cl. 417—283 **9 Claims**



1. A pump for supplying fluid to a system comprising

a rotor member,

a cam member encircling said rotor member,

means for effecting relative rotation of said cam and rotor members about an axis,

a plurality of vanes carried by one of said cam and rotor members, said vanes engaging the other of said members and defining pumping pockets which expand and contract on relative rotation of said members,

a cheek plate extending radially of the rotational axis and disposed adjacent one side of said rotor member and said cam member, said cheek plate being movable along the rotational axis to communicate expanding and contracting pockets,

means defining a cavity on one side of said cheek plate,

a first fluid passage conducting fluid pressure into said cavity which fluid pressure biases said cheek plate into a position blocking communication between said expanding and contracting fluid pockets,

a servo valve located in said cam member for venting the pressure in said cavity to thereby control the position of the cheek plate,

said servo valve including a valve spool having opposite surfaces against which fluid pressures act to control the axial position of said cheek plate,

means defining a variable control orifice having system pressure on a first side of said control orifice and pressure from the contracting pumping pockets on a second side of said control orifice,

means for communicating the fluid pressures on said first and second sides of said variable control orifice to said opposite sides of said valve spool, and

said means defining said variable control orifice including a member movable with said cheek plate to effect a reduction in the size of said orifice as said cheek plate moves away from said rotor and cam and an increase in the size of said orifice as said cheek plate moves towards said rotor and cam.

4,420,291

DYNAMIC COOLER APPARATUS FOR MOLTEN THERMOPLASTIC MATERIAL

Thomas W. Winstead, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Jan. 5, 1979, Ser. No. 1,178
Int. Cl.³ F04B 17/00, 35/04; F04C 2/16, 15/00
U.S. Cl. 417—338 **22 Claims**

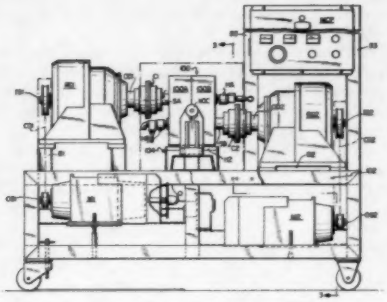
1. Means dynamically cooling and pumping molten thermoplastic material from an input source to an output device while isolating said input source from said output device, comprising:

a housing of a substantial mass of heat conducting material;

a pumping cavity defined within said housing and having inlet and outlet ports communicating therewith from opposite sides thereof;

first and second intermeshing pumping gears having a line of intersection mutually adjacent said inlet and outlet ports, each of said pumping gears having a plurality of teeth with troughs defined between adjacent said teeth;

first and second rotary pump shafts extending through said housing and said pumping cavity and respectively mounting said first and second pumping gears for rotation therewith;



heat exchange fluid circulating means extending internally of said pumping gears and through said housing in a flow configuration substantially encompassing said pumping cavity; and

first and second motor means driving said first and second pump shafts, respectively, independently of one another and in a load sharing manner to substantially preclude loading between said intermeshing pumping gears;

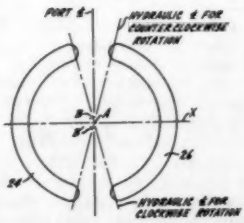
said teeth having a cross-section which optimally minimizes the cross-sectional area of molten thermoplastic material in said troughs to maximize exposed surface area and cooling efficiency.

4,420,292

BI-DIRECTIONAL INTERNAL/EXTERNAL GEAR PUMP WITH ADVANCED PORTING

Timothy P. Lutz, South Bend, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 9, 1981, Ser. No. 241,894
Int. Cl.³ F04C 2/04
U.S. Cl. 418—32 **14 Claims**



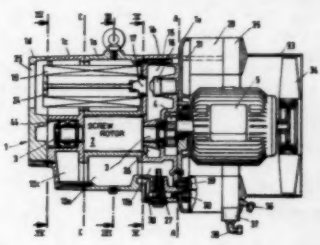
1. Bi-directional fluid displacement apparatus comprising a housing including a body defining an annular groove concentric about a first axis, said body also defining inlet and outlet ports with a port centerline, said ports being symmetrical about a line perpendicular to said port centerline, said housing also including a cover received in said groove, said cover defining an annular chamber concentric about a second axis parallel to said first axis, said chamber being in fluid communication with said inlet and outlet ports, a shaft journalled in said housing for rotation on said first axis, an internal/external gear set in said chamber, said internal gear being secured to said shaft for rotation therewith on said first axis, said external gear being rotatable on said second axis, said axes establishing the hydraulic centerline of said gear set, said cover having a first position wherein said hydraulic centerline is advanced relative to said port centerline by a predetermined angle of advance, said cover being rotatable to a second position wherein said hydraulic centerline is rotated substantially 180° minus twice said angle of advance, and means for securing said cover to said body in said first and second positions, said apparatus being constructed and arranged such that said hydraulic centerline intersects said inlet and outlet ports when said cover is in said first and second positions.

4,420,293

LIQUID COOLED COMPRESSOR WITH IMPROVED LIQUID SEPARATION

Rudolf Hofmann, Diedenbergen, Fed. Rep. of Germany, assignor to Isartaler Schraubenkompressoren GmbH, Geretsried, Fed. Rep. of Germany

Filed Sep. 23, 1980, Ser. No. 189,815
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1979, 2938557; Jun. 13, 1980, 3022277; Jun. 13, 1980, 3022249; Jun. 20, 1980, 3023092; Jul. 9, 1980, 3026000
Int. Cl.³ F04C 18/16, 29/02
U.S. Cl. 418—47 **10 Claims**



1. In a compact compressor apparatus comprising a screw compressor including screw rotors with liquid injection into the compression chamber for cooling and lubrication, having a liquid separator and a liquid collecting tank combined with the screw compressor in a housing that can be disassembled, and including air guide runs in sections parallel to the axes of rotation of the rotors, wherein a first section (8) runs from an air inlet opening (25) to the suction end of the compressor (26), and after a turn round of about 180°, is followed by a second section through the compressor, which after a turn round of about 180° is followed by a third section through the separator, which after a turn round of 180° is followed by a further section up to the connection of an outlet opening for compressed air, characterized in that

the third section is formed as a preseparation chamber that extends the length of the housing through the upper part of liquid collecting tank (12,41) and that after a turn round of 180° (12*b*) is followed by a main separation chamber (9) that extends in axial direction above the liquid collecting tank, in which main separation chamber a liquid separator (11) is provided, and an air exit opening (22) in the upper part of the main separation chamber (9).

4,420,294

APPARATUS FOR THE CONTINUOUS EXTRUSION OF ELECTRICALLY CONDUCTIVE GRANULATED MATERIALS, PREFERABLY POWDER METALLURGY MATERIALS

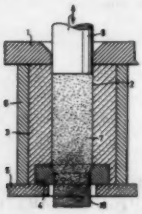
Klaus Lichtinghagen, Kirchhain, Fed. Rep. of Germany, assignor to Glacier GmbH-DEVA Werke, Stadtallendorf, Fed. Rep. of Germany

Division of Ser. No. 115,082, Jan. 24, 1980, Pat. No. 4,380,473. This application Nov. 20, 1981, Ser. No. 323,537

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1979, 2903510

Int. Cl.³ B22F *3/18*

U.S. Cl. 425—79 **11 Claims**



1. An apparatus for performing a process for the continuous extrusion of electrical conductive granulated material, preferably powder metallurgy material, comprising:

a die having a wall defining a passage duct for the travel of said material and wherein said wall comprises an electrically non-conductive material;

a nozzle disposed on said die;

a reciprocating punch movable into said duct for compressing and advancing said material in said duct and for extruding a string of said material through said nozzle on said die;

a power supply having electrical terminals; and

means for connecting said punch and said nozzle to said terminals of said power supply, whereby said material in said duct is heated by a longitudinal flow of electric current therethrough as said material is being compressed and advanced.

4,420,295

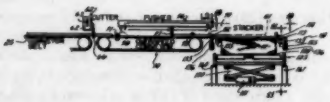
APPARATUS FOR MANUFACTURING CEMENTITIOUS REINFORCED PANELS

Theodore E. Clear, 903 Harrison Ave., and Paul E. Dinkel, 645 Hamilton-New London Rd., both of Hamilton, Ohio 45013

Division of Ser. No. 78,932, Sep. 26, 1979, Pat. No. 4,281,952, which is a division of Ser. No. 887,324, Mar. 16, 1978, Pat. No. 4,203,788. This application May 21, 1981, Ser. No. 265,898

Int. Cl.³ B29C *17/14*; B29D *3/02*

U.S. Cl. 425—92 **4 Claims**



1. Apparatus for manufacturing cementitious panels of the type having a nailable cementitious aggregate core faced on each major side with a reinforcing element bathed in a slurry comprising hydraulic cement, said apparatus comprising:

a conveyor means for conveying a plurality of flat, abutting carrier sheets;

a slurry trough containing a slurry bath comprising hydraulic cement;

means for running a first reinforcing web through said trough and for metering the amount of slurry adhering to said first web;

a drag bar means engaging an upper side of said first web for pushing said slurry through said first web, and said slurried web onto moving carrier sheets on said conveyor;

means for depositing a metered amount of a nailable aggregate cementitious core material onto said slurried web;

means for compacting said core material;

a second slurry trough containing a slurry bath comprising hydraulic cement;

means for running a second reinforcing web through said trough and for metering the amount of slurry adhering to said first web;

second drag bar means engaging an upper side of said second web for pushing said slurry through said second web, and said second slurried web onto said aggregate core material, said second web adhering thereto, and thereby forming an elongated uncured panel web;

means for transversely cutting separate panels from said uncured panel web between adjacent carrier sheets; and

means for stacking said separate panels for curing.

4,420,296

CLOSURE ASSEMBLY

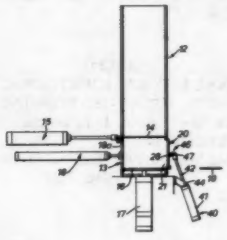
Michael P. Anderson, Park Orchards, Australia, assignor to Kovan Engineering Pty. Ltd., Australia

Filed Jun. 10, 1982, Ser. No. 386,918

Claims priority, application Australia, Feb. 19, 1982, PF2772

Int. Cl.³ A01J *25/13, 25/15*; B29C *1/00*; E06B *5/00*

U.S. Cl. 425—444 **18 Claims**



1. A closure assembly comprising:

structure defining an opening;

a closure member mounted to said structure for movement to and from a position in which it closes said opening;

co-operable locking means on said structure and closure member including a first element fixedly mounted to a shaft for rotation with the shaft, which is in turn rotatably supported on said closure member, and a second element defining a seat for said first element in a particular rotational position of the shaft, seated engagement between the elements at this position physically locking the closure member in its closed position; and

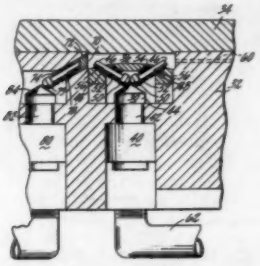
drive means coupled between the structure and said shaft, reversibly actuable to execute a first motion in which it drives said closure member from an open condition to said closed condition and then a succeeding second motion in which it causes rotation of said shaft to effect seated engagement between said elements of the co-operable locking means.

4,420,297

RETRACTABLE APPARATUS FOR SHOE SOLE MOLDS

Francis O. Remon, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Apr. 27, 1981, Ser. No. 257,902
Int. Cl.[3] A23P 1/00
U.S. Cl. 425—577 1 Claim



1. A mold apparatus which defines a shoe sole mold cavity and a conduit for injecting material into said shoe sole mold cavity;

a reciprocably movable mechanism which forms impressions in the side wall and through the sole material injected in said mold cavity;

said reciprocably movable mechanism comprising a pressurizable piston and cylinder unit in rubbing contact with a pair of biased pins to effect proper motion therebetween, said pins being supported in channels directed towards said mold cavity;

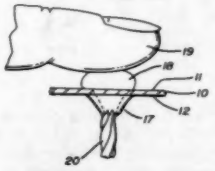
said pins being biased by springs which are engaged between a shoulder in said channels, and a head on one end of each of said pins, said biasing being effective to force said pins to retract from said mold cavity upon depressurization of said cylinder unit.

4,420,298

DEVICE FOR MAKING SPATZELS

Ann Mandrick, 659 Perkins Dr., Warren, Ohio 44483

Filed Jul. 30, 1981, Ser. No. 288,298
Int. Cl.[3] A21C 3/04, 11/16
U.S. Cl. 425—463 2 Claims



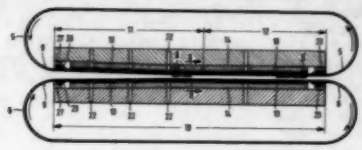
1. A spatzel making device comprising a thin, flat metal body member having a plurality of spaced apertures punched therein of sufficient size for forming spatzed therethrough, depending tubular members formed on said body member from the metal displaced from said punched apertures and extending from the metal around said apertures, each tubular member defining a slightly tapered passageway terminated in irregular, angular, twisted configurations by said displaced metal, the edges of said tubular members having circumferentially irregular patterns arranged so that dough pushed therethrough will rotate about its axis and conform with the shaped angular configuration of the ends of the tubular members, a handle formed on said body member extending outwardly therefrom.

4,420,299

CONTINUOUS OPERATION PRESS

Albert De Mets, Roeselaare, Belgium, assignor to De Mets N.V., Izegem, Belgium

Filed Nov. 16, 1981, Ser. No. 321,564
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 8030533[U]; May 26, 1981, 8115711[U]
Int. Cl.[3] B30B 5/06
U.S. Cl. 425—101 65 Claims



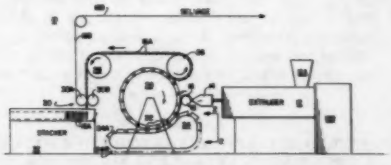
1. A continuous operation press for at least one of producing and treating a board web, the press having a press area including a main press area and a calibration area disposed rearwardly of a main press area, as viewed in a conveying direction of the board web, upper and lower belts for defining upper and lower carrying runs between which the board web is carried, the upper and lower belts being adapted to continuously circulate at a constant speed, characterized in that upper and lower abutment means extending substantially perpendicular to a conveying direction of the board web are provided and extend over an entire width of the press area of the press, the upper and lower abutment means are respectively disposed in proximity to an underside of the upper and lower belts, a friction reducing means is arranged on the respective abutment means in at least one of the main press area and calibration area, each friction reducing means including a friction reducing surface cooperable with the underside of the upper and lower belts, the friction reducing means extends over an entire width and length of at least one of the main pressing area and the calibration area, and means for supplying a lubricant to the friction reducing means including lubricant supplying openings formed in each of the friction reducing means at a position spaced from lateral edges of the friction reducing means.

4,420,300

CONTINUOUS ROTARY THERMO-FORMING SYSTEMS AND APPARATUS OF THE PRESSURE ASSIST, PLUG ASSIST AND MATCH MOLD TYPE

Thomas W. Winstead, Cockeysville, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Division of Ser. No. 177,582, Aug. 13, 1980. This application Apr. 20, 1982, Ser. No. 370,293
Int. Cl.[3] B29C 17/04, 17/10; B29D 7/02
U.S. Cl. 425—142 23 Claims



1. Forming means for continuously thermo-forming molded products from a continuously extruded web of thermoplastic material and utilizing the heat of extrusion to maintain the web in a thermoformable state, comprising:

extrusion means continuously emitting a heated thermoformable web of thermoplastic material;

rotary mold wheel means downstream from said extrusion means having a plurality of mold cavities peripherally

positioned thereon in a correlated number of peripheral mold faces for receiving said heated thermoformable web on the periphery thereof at a point of ingestion;

vacuum means in said mold wheel means selectively applying vacuum to the interior of said mold cavities to constrain respective portions of said web to be drawn into said mold cavities to form products conforming to the shape of said mold cavities;

plural reciprocatable interlinked assist means immediately downstream of said point of ingestion and immediately adjacent and conformally extending over a predetermined arc of registry with the periphery of said mold wheel for applying a constraining force to discrete portions of said web over said mold cavities in conjunction with the action of said vacuum means over substantially the length of said arc of registry to enhance the draw of said web into said mold cavities;

discharge means for continuously stripping said web and said thermoformed products from said mold wheel;

separating means for separating said thermoformed products from said web in the provision of web selvage; and

return means returning said selvage to said extrusion means for recycling.

4,420,301

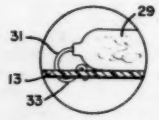
MINIATURE MULTILAMP PHOTOFLASH ARRAY

John W. Shaffer, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 29, 1981, Ser. No. 277,797

Int. Cl.³ F21K *5/00*

U.S. Cl. 431—359 **13 Claims**



1. A multilamp photoflash array comprising:

a housing member having a back portion and an attachable front portion, said back portion having inner and outer surfaces and a camera mounting means extending outwardly therefrom and said front portion being light transmittable;

a printed circuit disposed on said inner surface of said back portion of said housing member and on said camera mounting means for providing an electricl signal from a camera to said printed circuit;

a reflector unit disposed intermediate said back and front portions of said housing member, said reflector unit having a plurality of cavities each having a reflective surface and formed to receive a flashlamp; and

a flashlamp disposed within each one of said cavities of said reflector unit and characterized by the improvement wherein each of said flashlamps has a pair of electrical conductors extending through and supported by said reflector unit and contacting said printed circuit on said inner surface of said back portion of said housing member.

4,420,302

METHOD AND APPARATUS FOR THERMALLY TREATING PULVERULENT MATERIALS

Hans B. Knudsen, Kolding, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Nov. 16, 1981, Ser. No. 321,724

Claims priority, application United Kingdom, Nov. 17, 1980, 8036838

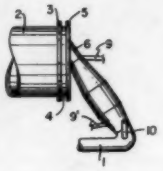
Int. Cl.³ F27B *15/00*; F26B *17/00*; C04B *7/02*

U.S. Cl. 432—14 **25 Claims**

1. Method of thermally treating pulverulent material in a rotary kiln having its axis inclined to the horizontal, the rotary kiln having an upper end and a lower end, an upper portion and a lower portion, comprising:

introducing the material and fuel in suspension in a gas into the upper portion of the rotary kiln adjacent its upper end by introducing the material in suspension with a tangential velocity component;

thermally treating the material in the upper portion so as to raise the temperature of the material to approximately its sintering temperature;



separating the material from the suspension in the upper portion of the rotary kiln as a result of said introducing the material in suspension with a tangential velocity component;

further thermally treating the separated material during its passage through the rotary kiln;

discharging the thermally treated material from the lower end of the rotary kiln; and

withdrawing the gas from the rotary kiln through at least one of its ends.

4,420,303

METHOD AND APPARATUS FOR THERMALLY TREATING PULVERULENT MATERIALS

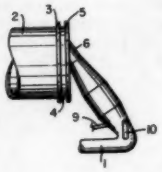
Hans B. Knudsen, Kolding, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Nov. 16, 1981, Ser. No. 321,700

Claims priority, application United Kingdom, Nov. 17, 1980, 8036856

Int. Cl.³ F27B *15/00*; F26B *17/00*; C04B *7/02*

U.S. Cl. 432—14 **19 Claims**



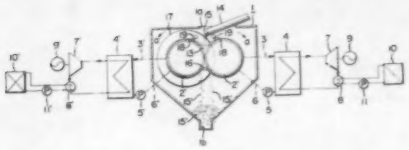
1. Method of thermally treating pulverulent material in a reaction chamber having its axis slightly inclined to the horizontal, the reaction chamber having an upper end and a lower end, an upper portion and a lower portion, comprising thermally treating the material in suspension in a gas to a predetermined treating temperature outside the reaction chamber, introducing the material in suspension with a tangential velocity component in the upper portion of the reaction chamber adjacent its upper end such that the material heated to the predetermined treating temperature is separated from the suspension in said upper portion of the reaction chamber, as a result of said introducing the material in suspension with a tangential velocity component, rotating the reaction chamber, further thermally treating the separated material during its passage through the reaction chamber, discharging the thermally treated separated material from a lower end portion of the reaction chamber, and withdrawing the gas from the reaction chamber through at least one of its ends.

4,420,304

APPARATUS FOR MANUFACTURING RAPIDLY COOLED SOLIDIFIED SLAG

Genji Nakatani; Kazuo Kanai; Haruo Itoh; Yasuto Takasaki; Kenji Ohkoshi, and Yoshinobu Yanagida, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1982, Ser. No. 339,143
Claims priority, application Japan, Jan. 30, 1981, 56-12778
Int. Cl.³ F27D *15/02*; F28D *11/02*; C21B *3/06*
U.S. Cl. 432—83 **4 Claims**



1. An apparatus for manufacturing a rapidly cooled solidified slag, which comprises:

a pair of cooling drums each having the same diameter and the same length, the axial lines of said pair of cooling drums being arranged in parallel with each other in the same horizontal plane, the peripheral surfaces of said pair of cooling drums being in contact with each other;

a driving means for rotating said pair of cooling drums, said driving means being adapted to rotate said pair of cooling drums in directions opposite to each other at the same peripheral speed in the rising direction of the peripheral surface of each of said pair of cooling drums at the contact portion of said pair of cooling drums;

a pair of weirs provided at the both ends of said pair of cooling drums, said pair of weirs forming a slag sump in cooperation with the upper half of the peripheral surface of each of said pair of cooling drums;

a slag feeding means arranged above said pair of cooling drums, for pouring a molten slag into said slag sump;

a scraper provided so as to be in contact with the lower half of the peripheral surface of each of said pair of cooling drums;

a cooling medium for cooling said pair of cooling drums, said cooling medium being supplied into each of said pair of cooling drums through the center axle of each of said pair of cooling drums to cool same, said cooling medium exchanging heat with said molten slag in said slag sump, which has been deposited onto the peripheral surface of each of said pair of cooling drums, along with the rotation of each of said pair of cooling drums, and, said cooling medium which has exchanged heat with said molten slag being discharged through said center axle of each of said pair of cooling drums for heat recovery;

whereby said molten slag deposited onto the peripheral surfaces of said pair of cooling drums is converted into a rapidly cooled solidified slag through heat exchange with said cooling medium and is then peeled off from the peripheral surfaces of said pair of cooling drums by means of said scraper, along with the rotation of said pair of cooling drums;

a pair of gas nozzles for controlling the thickness of said molten slag which has been deposited onto the peripheral surfaces of said pair of cooling drums to a predetermined thickness, each of said pair of gas nozzles being provided adjacent to the peripheral surface of each of said pair of cooling drums at a location between the uppermost position of the peripheral surface of each of said pair of cooling drums and said slag sump, each of said pair of gas nozzles having a slit which has substantially the same length as the length of said cooling drums, said slit of each of said pair of gas nozzles being arranged horizontally and in parallel with the axial lines of said cooling drums, each of said pair of gas nozzles uniformly ejecting a gas onto said molten slag deposited on the peripheral surface of each of said pair of cooling drums to blow part of said molten slag deposited on the surface of each of said pair of cooling drums back into said slag sump, thereby uniformly reducing the thickness of said molten slag deposited on the peripheral surface of each of said pair of cooling drums; and

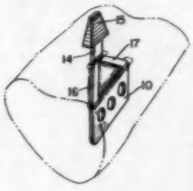
each of said pair of weirs having an annular shape and having a hollow portion therein, each of said pair of weirs being fixed to each of the ends of the peripheral surface of one of said pair of cooling drums so that two circular flanges are formed around the entire circumference thereof at right angles to the axial line of said one cooling drum, said hollow portion of each of said pair of weirs communicating with the interior of said one cooling drum, and, said cooling medium passing through said hollow portion of each of said pair of weirs and said one cooling drum, thereby cooling said pair of weirs and said one cooling drum.

4,420,305

OBLIQUE ORAL IMPLANT

Leonard I. Linkow, 1530 Palisade Ave., Fort Lee, N.J. 07024

Filed Sep. 14, 1982, Ser. No. 418,043
Int. Cl.³ A61C *13/00*
U.S. Cl. 433—176 **4 Claims**



1. An oral implant for permanently implanting an artificial tooth supporting structure in a jawbone at a certain location along the plane of occlusion where the jawbone is insufficient to permit the insertion of an implant blade, comprising:

a remote blade adapted for positioning into the jawbone at a location remote buccal-lingually from the certain location and at a position wherein there is sufficient bone structure to support it;

at least one post at the certain location along the plane of occlusion, said post being adapted for mounting an artificial tooth; and

cross-connecting structure extending buccal-lingually for connecting the post and the remote blade.

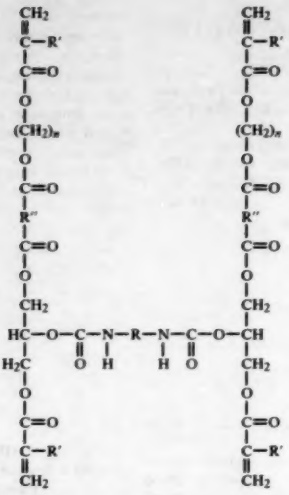
4,420,306

TETRAACRYLIC AND TETRAMETHACRYLIC ESTERS AND DENTAL MATERIALS CONTAINING SAME

Jan A. Orlowski, Altadena, Calif.; Helmar Wagner, Darmstadt-Arheilgen, Fed. Rep. of Germany, and David V. Butler, W. Covina, Calif., assignors to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

Filed Jun. 24, 1982, Ser. No. 391,922
Int. Cl.³ A61K *6/08*
U.S. Cl. 433—228 **12 Claims**

1. Tetraacrylic and tetramethacrylic acid esters of the general formula



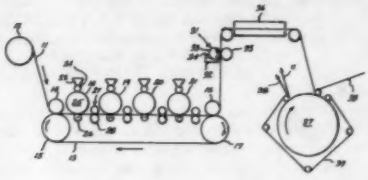
where R is a divalent (ar)aliphatic, cycloaliphatic, or aromatic group with 4 to 18 carbon atoms; R′ is H or methyl; R″ is a —CH=CH—, —CH_2CH_2—, —$CH_2CH_2CH_2$—, —$CH_2CH_2CH_2CH_2$—, an optionally substituted or hydrogenated benzene group, a cyclohexane group, or a cis-norbornene group, and n is 2 or 3.

4,420,307

PRINTING PROCESS

Emery J. Gorondy, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jun. 28, 1982, Ser. No. 392,789
Int. Cl.³ D06P 5/20
U.S. Cl. 8—444 5 Claims



1. A process for dyeing a disperse dyeable textile material comprising the steps of:

forming a latent magnetic image in a magnetic imaging member comprising a ferromagnetic material imposed on an electrically conductive support;

developing the latent magnetic image by applying thereto a ferromagnetic toner comprising a ferromagnetic component, a dye component containing a dye that is substantially sublimable at from 160° to 215° C., and a resin which substantially encapsulates the ferromagnetic component and the dye component,

transferring the developed image from the magnetic imaging member to a surface of a paper sheet, applying a layer of a sublimable-dye-permeable polymeric material over the image to the paper sheet,

bringing said polymeric material into contact with a disperse dyeable textile material to be dyed,

heating the disperse dyeable textile material and the polymeric film and paper sheet to cause substantial sublimation of the dye component, thereby transferring said dye image from the paper through the polymeric material to form a dye image on the disperse dyeable textile material.

4,420,308

PROCESS FOR THE PRODUCTION OF RESERVE EFFECTS ON POLYESTER TEXTILES AND POLYESTER/CELLULOSE MIXED FIBRE TEXTILES: DISCHARGE PRINTING WITH DISPERSE AZO DYE WITH ALKYL OR ALKOXY CARBONYL, CYAND AND HYDROXY PHENYL GROUP

Ulrich Bühler, Schöneck; Horst Kindler, Frankfurt; Klaus Kühlein, Kelkheim; Maria Kallay, Königstein; Uwe Kosubek, Büttelborn; Rudolf Löwenfeld, Dreieich, and Kurt Roth, Hofheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 1, 1982, Ser. No. 384,074
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1981, 3135433
Int. Cl.³ C09B 29/01; D06P 5/12
U.S. Cl. 8—464 8 Claims

1. In the process for the preparation of white patterns or patterns of various colors on a colored substrate on textile materials comprising hydrophobic synthetic fibres or on textile materials based on mixed fibres composed of polyester and cellulose comprising impregnating the materials with dye liquores which, besides the customary dyeing and padding auxiliaries, contain disperse dyestuffs which are dischargeable to white, and if mixed fibre textiles are processed, contain, optionally, reactive dyestuffs which are dischargeable to white and which have, as a reactive anchor, a group of the formula

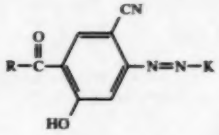
$$-SO_2-CH_2-CH_2-Hal,$$

$$-SO_2-CH_2-CH_2-O-SO_3M,$$

$$-NH-SO_2-CH_2-CH_2-O-SO_3M \text{ and}$$

$$-SO_2-CH=CH_2$$

and printing on, in the desired pattern, a discharge reserve paste which, besides the discharge reserving agent, also contains, optionally, dyestuffs which are resistant to discharging agents, and by subsequently subjecting the material to a heat treatment at temperatures of 100° to 230° C., in which process, if no reactive dyestuffs which are dischargeable to white are present, the discharge reserving agent employed is a base which produces a pH value of at least 8 in a 5% strength aqueous solution, or is a discharge reserving agent based on sulphites which contains an alkali metal sulphite or an alkali metal bisulphite in combination with an alkali metal carbonate or bicarbonate and, optionally, an aldehyde, and which, optionally contains a nonionic detergent, and if the abovementioned reactive dyestuffs which are dischargeable to white are present, the discharge reserving agent based on sulphites is employed, the improvement which comprises employing as the dischargeable disperse dyestuffs, dyestuffs having the formula I



(I)

in which R is optionally substituted alkyl having 1 to 8 carbon atoms, optionally substituted alkoxy having 1 to 8 C atoms, and K is the radical of a coupling component of the benzene, naphthalene, pyridine, benzpyridine, diazole, thiazole, indole, carbazole, oxazole or diazine series or the series of enolisable 1,3-dicarbonyl compounds, the molecule of which dyestuffs contains not more than one esterified carboxyl group.

4,420,309

PROCESS FOR THE CONTINUOUS OR SEMICONTINUOUS DYEING OF TUBULAR KNITTED FABRICS OF CELLULOSE FIBERS WITH AZO DEVELOPING DYESTUFFS AND ACRYLAMIDE POLYMER

Hans-Ulrich von der Eltz, Frankfurt am Main; Peter Heinisch, Kelkheim, and Hans J. Ballmann, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 288,014, Jul. 29, 1981, abandoned. This application Jul. 22, 1982, Ser. No. 401,015
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3028844
Int. Cl.³ D06P 1/12, 3/68
U.S. Cl. 8—555 11 Claims

1. In a process for the even dyeing of a tubular knitted fabric in hose form, consisting of or containing preponderantly cellulose fibers, with at least one water-insoluble azo dyestuff produced on the fiber according to a continuous or semicontinuous method, in which the impregnation is performed by prepadding the hose fabric with a coupling component under alkaline conditions, and subsequently the development of the dyestuff is effected, wet-in-wet, by slop padding the textile goods with a diazo component in the presence of an acid and/or an acid-forming substance, the improvement which comprises incorporation into the alkaline impregnation bath containing the coupling component a combination of a polymeric component selected from the group consisting of homopolymers and copolymers of acrylic acid amide and mixtures thereof, said polymeric component being incorporated in an amount of from 10 to 30 g/l in the form of a 2 to 8% (by weight) aqueous formulation, and of from 2 to 20 g/l of an

anionic wetting agent; and likewise incorporating into the acidic developing liquor containing the diazo component capable of being coupled a combination of a polymeric component selected from the group consisting of homopolymers and copolymers of acrylic acid amide and mixtures thereof, said polymeric component being incorporated in an amount of from 30 to 60 g/l in the form of a 2 to 8% (by weight) aqueous formulation, and of from 2 to 20 g/l of an anionic or nonionic wetting agent.

4,420,310

USE OF OXYALKYLATED NOVOLAKS AS PREPARATION AGENTS FOR DISPERSE DYESTUFFS AND PREPARATIONS MADE WITH SAID AGENTS

Konrad Opitz, Liederbach; Max Grossmann, Frankfurt am Main; Hurbert Kruse, Kelkheim; Manfred Schneider, Eppstein, and Heinz Uhrig, Steinbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengeselischaft, Frankfurt am Main, Fed. Rep. of Germany

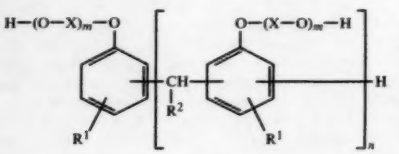
Filed Jan. 14, 1980, Ser. No. 111,793

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1979, 2901461

Int. Cl.³ B06P *1/56, 1/16*

U.S. Cl. 8—560 **13 Claims**

1. A disperse dyestuff preparation containing an effective amount of a water-soluble oxalkylate of the formula



wherein R^1 is straight-chain or branched alkyl of from 1 to 18 carbon atoms, R^2 is hydrogen or straight-chain or branched alkyl of from 1 to 18 carbon atoms, X is ethylene, propylene or both ethylene and propylene, m is a number of from 6 to 100 and n is a number of from 1 to 12.

4,420,311

DIESEL FUEL COMPOSITION

Samuel G. Thomas, Jr., Rochester, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 9, 1982, Ser. No. 440,182

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—53 **2 Claims**

1. Liquid fuel adapted for use in a diesel engine, said fuel being selected from the group consisting of liquid hydrocarbons of the diesel boiling range, alcohols and mixtures thereof, and said fuel containing a cetane increasing amount of an additive of the formula

wherein R is selected from the group consisting of hydrogen, alkyl containing 1–12 carbon atoms and alkoxy containing 1–12 carbon atoms and n is an integer from 0 to 3.

4,420,312

METHOD FOR PRODUCTION OF HIGH FLUORIDE COMPATIBILITY DENTIFRICE ABRASIVES AND COMPOSITIONS

Satish K. Wason, Churchville, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 41,952, May 23, 1979, which is a continuation of Ser. No. 862,384, Dec. 20, 1977, abandoned. This application Sep. 23, 1980, Ser. No. 189,881

The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.

Int. Cl.³ C04B *31/16;* **C09C** *1/68*

U.S. Cl. 51—308 **8 Claims**

1. A method for the production of an abrasive composition comprising a precipitated amorphous silicon dioxide, which silicon dioxide has been prepared from a fresh water alkali metal silicate solution by acidulation, and has been intimately reacted with a compound of an alkaline earth metal so as to have present therein about 10–300 parts per million of alkaline earth metal ions in said amorphous silicon dioxide and which exhibits a Radioactive Dentin Abrasion value of at least 40, a pack density of about 0.24 to 0.55 grams per milliliter, an oil absorption of about 70–95 ccs/100 grams, a BET surface area of about 100–250 m^2/g, and a percent loss on ignition of about 4–6%, said abrasive composition, when incorporated into toothpaste compositions containing a fluoride therapeutic agent, providing a toothpaste composition which exhibits minimal loss of soluble fluoride upon storage at normal temperatures, and providing a fluoride compatibility value to the toothpaste of at least 90%, said method comprising (a) forming an aqueous solution of an alkali metal silicate having an SiO_2 to X_2O mole ratio of about 2.0 to 2.7, wherein X is alkali metal, at a reaction temperature in the range of about 77° to 91° C., (b) acidulating said alkali metal silicate solution with a mineral acid until precipitation of silicon dioxide is substantially complete, then continuing the mineral acid addition until the pH is 6.0 or less, (c) digesting by heating at a temperature for a period of 10–30 minutes, (d) filtering the resulting slurry and washing the solid product with fresh water, (e) reslurrying the resulting wet cake in water and under agitation conditions, (f) adding sufficient alkaline earth metal ion in the form of a sufficiently soluble alkaline earth metal compound in sufficient amount to add to said wet cake alkaline earth metal ions in the range of 10–300 parts per million based on the dry recoverable product in said slurry, (g) agitating the resulting mixture to provide adherence of the effective level of said alkaline earth metal treatment on the surface of said silicon dioxide, and (h) drying and recovering the solid abrasive composition.

4,420,313

METHOD FOR DUST REMOVAL FROM SOLID-GAS CONTACT REACTOR

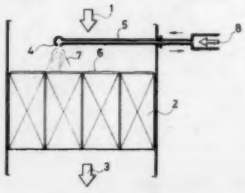
Michio Hada; Yoshihiro Shiraishi; Masao Hino, and Seto Toru, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Hiroshima, Japan

Continuation of Ser. No. 210,379, Nov. 26, 1980, abandoned. This application Mar. 12, 1982, Ser. No. 357,684

Claims priority, application Japan, Nov. 26, 1979, 54-152684

Int. Cl.³ B01D *46/04*

U.S. Cl. 55—96 **6 Claims**



1. A method for removing dust particles from the packings

of a solid gas contact reactor of the parallel gas flow type which includes a housing having a packing section including packing having a plurality of passages formed in the flow direction of a gas passing therethrough, said packing having upper and lower surfaces to prevent inhibiting the flow of gas through said passages in the packing due to accumulation of dust particles thereon which comprises an externally supplied cleaning gas through said passsages at a gas flow velocity of from 15 to 30 meters per second at the inlet of said packing section by passing said gases through a plurality of nozzles mounted in a stationary or movable bank near the inlet at which the gas enters the packing section, said bank when movable being movable at substantially right angles to the flowing direction of the gas through said nozzles, the number of nozzles being such that the cleaning gas issuing therefrom covers said upper, the diameters of said nozzles being from 2 mm to 20 mm, said nozzles being located at a distance of from 0.2 to 1.0 meter from the upper of said packing.

4,420,314

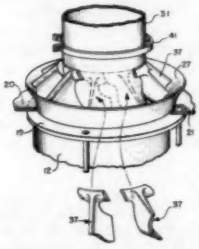
GAS-SOLIDS SEPARATOR

Alvah V. Barron, Jr., Birmingham, Ala., assignor to Barron Industries, Inc., Leeds, Ala.

Continuation of Ser. No. 802,830, Jun. 2, 1977, abandoned. This application Jan. 23, 1979, Ser. No. 5,812

Int. Cl.³ B01D *45/12*

U.S. Cl. 55—436 **3 Claims**



2. An apparatus for removing particulate matter from gases which comprises:

an outer tube having a tube section and a bell-mouth-shaped lip forming its upper end;

an inner tube having an entrance end and an exit end, said inner tube being coaxial with respect to said outer tube, said entrance end extending partially into said outer tube and said exit end extending beyond said upper end;

a plurality of stationary, airfoil-shaped vanes, secured next to one another around an annular passageway defined between said inner tube and said outer tube and spaced apart sufficiently to permit gases to pass between them, each vane being a separate element removable and replaceable without disturbing other vanes of said apparatus, said vanes having leading edges substantially thicker than the remaining portion of said vanes, said leading edges extending upstream of said passageway, said vanes being shaped for imparting a vortical path to gases passing through said annular passageway, said bell-mouth-shaped upper end and said airfoil-shaped vanes with their thick edges extending above the passageway improving laminarity of flow through said annular passageway.

4,420,315

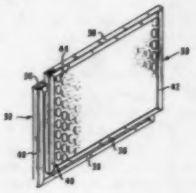
NESTING AIR FILTERS

Eli J. Kershaw, 530 Retreat La., Powell, Ohio 43065

Continuation-in-part of Ser. No. 136,909, Apr. 3, 1980. This application Jan. 22, 1981, Ser. No. 227,218

Int. Cl.³ B01D *46/10*

U.S. Cl. 55—501 **25 Claims**



1. In a stack of air filters each including a filter element of fibrous material and a quadrangular frame for supporting said filter element at its marginal edges, the improvement comprising:

a set of recesses formed in each filter frame at positions adjacent to diagonally opposite corners of said frame, each of said recesses being adapted to receive the frame of another air filter, said air filters being stacked with first and second air filters in the stack overlapped and arranged in a laterally offset relationship and subsequent air filters in the stack also overlapped and arranged in a laterally offset relationship and with the recesses of each air filter receiving the frame of the next air filter in the stack to allow said first and second air filters to nest together and to allow said second air filter and each subsequent air filter to nest with the next air filter in the stack.

4,420,316

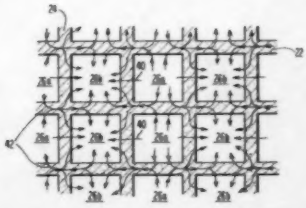
FILTER APPARATUS AND METHOD OF MAKING IT

Rodney I. Frost, Corning, and Wayne H. Pitcher, Jr., Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,998

Int. Cl.³ B01D *39/20*

U.S. Cl. 55—523 **14 Claims**



1. In an apparatus for filtering solid particulates from fluids including a filter of honeycomb structure comprising:

a matrix of interconnected thin porous walls comprising at least one inlet end face and at least one outlet end face of the filter and a multiplicity of cells, each cell extending through the filter from at least one of the inlet or outlet end faces,

an outlet group of cells each open at at least one outlet end face and closed at each adjoining inlet end face,

an inlet group of cells each open at at least one inlet end face and closed at each adjoining outlet end face, substantially all cells of the inlet group each sharing at least one thin wall in common with another adjoining cell of the inlet group, and

the thin walls containing interconnected open porosity of a

volume and size sufficient to enable the fluid to flow completely across the narrow dimension and through the longer dimensions of the thin walls and to restrain most or all of the solid particulates from passing either completely across or completely through the thin walls in any direction,

whereby filtering occurs through all thin walls defining each inlet cell.

14. A method of fabricating a structure for filtering solid particulates from fluid passed through the body comprising the steps of:

providing a matrix of thin interconnected porous walls defining at least one inlet and one outlet end face and a multiplicity of cells extending substantially through the structure from an inlet or outlet end face, the walls containing interconnected open porosity of a volume and size sufficient to enable the fluid to flow completely across and through the thin walls in any direction, including through the longer dimensions of the thin walls, and to restrain at least a significant portion of the solid particulates in the fluid from passing either completely across or through the thin walls in any direction,

forming an inlet group of cells, each inlet cell being open at at least one inlet end face and closed along any adjoining outlet end face and some inlet cells sharing thin walls in common with other inlet cells; and

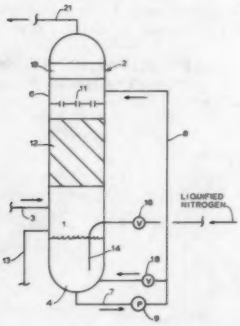
forming an outlet group of cells, each outlet cell being open at at least one outlet end face and closed along any adjoining inlet end face.

4,420,317

PROCESS FOR RECOVERING VAPORIZED SOLVENT WHICH ELIMINATES HEAT EXCHANGERS

Nelson Stewart, 151-18 35th Ave., Flushing, N.Y. 11354

Filed Oct. 29, 1981, Ser. No. 316,354
Int. Cl.³ F25J 3/00
U.S. Cl. 62—20 **12 Claims**



1. A process for recovering solvent vapor by passing said vapor through a container having a first, second, and third portion while contacting in said second portion, flowing chilled liquid solvent, which condenses said vapor, the first portion of said container including a liquid solvent reservoir of recovered liquid solvent, comprising the steps of:

introducing said solvent vapor into said first portion of said container;

transporting chilled liquid solvent from the liquid solvent reservoir in said first portion of said container to said third portion of said container for enabling said liquid solvent to flow through liquid/vapor/gas contacting means positioned within said second portion of said container to condense solvent vapor within said second portion; and,

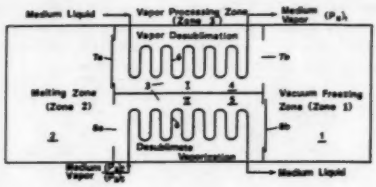
introducing liquified gas directly into said liquid solvent reservoir within said first portion of said container at rates selected to provide turbulence sufficient to avoid equipment clogging problems otherwise incidental to tracewater freezing in said liquid solvent.

4,420,318

VACUUM FREEZING PROCESS WITH MULTIPLE PHASE TRANSFORMATIONS OF LOW PRESSURE VAPOR

Chen-Yen Cheng, and Sing-Wang Cheng, both of 9605 La Playa St., NE., Albuquerque, N. Mex. 87111

Filed Oct. 28, 1981, Ser. No. 315,858
Int. Cl.³ B01D 9/04
U.S. Cl. 62—542 **16 Claims**



1. A process of separating a mixture containing a solvent and at least one low volatily solute through the formation of a mass of solvent crystals that comprises a first step of flash vaporizing the mixture under a reduced pressure to simultaneously form solvent crystals and thereby transform the mixture into a first vapor whose pressure is lower than the triple point pressure of the solvent and a first condensed mass that contains the solvent crystals, a second step of cooling the first vapor under a pressure lower than the said triple point pressure to thereby transform the first vapor into a second condensed mass containing a mass of solvent solid, a third step of melting the solvent solid to transform the second condensed mass into a melt liquid, a fourth steps of vaporizing a mass of solvent liquid to thereby form a second vapor whose pressure is slightly higher than the said triple point pressure, and a fifth step of bringing the second vapor and solvent crystals derived from the first condensed mass into a heat exchange relation to thereby condense the second vapor and melt the solvent crystals.

4,420,319

MUSHROOM GROWTH ENHANCERS AND METHOD FOR PREPARING SAME

R. Barry Holtz, Los Gatos, Calif., assignor to Spawn Mate, Inc., San Jose, Calif.

PCT No. PCT/US80/01136, § 371 Date Aug. 9, 1981, § 102(e) Date Aug. 9, 1981, PCT Pub. No. WO82/00637, PCT Pub. Date Mar. 4, 1982
PCT Filed Aug. 25, 1980, Ser. No. 298,241
Int. Cl.³ C05G 3/00; A01G 1/04
U.S. Cl. 71—5 **21 Claims**

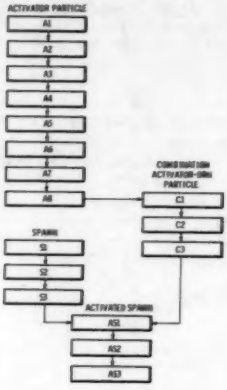
1. A method of preparing a biological activator and nutrient material for use with mushroom cultures, in steps comprising:

preparing a plurality of activator particles, said activator particles being adapted to induce enzyme synthesis within the cell and said particles being generally spherical in shape and including an inner core of at least one readily assimilable lipid material surrounded by a layer of at least one antioxidant-surfactant, said antioxidant-surfactant being adapted to slow cellular aging by inhibiting free radial formation, and microencapsulated by an outer layer of activated protein said activated protein being easily accessible to nascent mushroom mycelium;

coagglomerating an amount of the activator particles with a larger amount by weight of a delayed released nutrient material in the presence of a binding agent to form discrete combined particles of relatively small size, said delayed released nutrient material being in the form of particles,

approximately one thousand times larger in size than the activator particles, and including a lipid droplet microencapsulated by a layer of partially denatured protein solids, said protein solids being less accessible to said mushroom mycelium such that said mycelium will preferentially attack the activator particles;

drying the resulting coagglomerated particles; and



contacting said coagglomerated particles with mushroom spawn.

14. The method of preparing as recited in claim **13** wherein said mushroom spawn has been innoculated onto seed grain approximately four days before being put into proximity with said coagglomerated particles.

4,420,320

METHOD OF BIOLOGICALLY DRYING WASTE MATERIAL

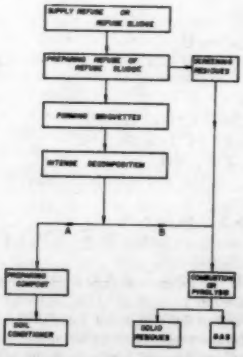
Randolph Hartmann, Karlsruhe, and Helmut Schriewer, Maximiliansau, both of Fed. Rep. of Germany, assignors to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 299,060, Sep. 3, 1981, abandoned, which is a continuation of Ser. No. 125,778, Feb. 29, 1980, abandoned. This application Oct. 23, 1981, Ser. No. 314,509

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1979, 2939229

Int. Cl.[3] **C05F** *7/00;* **C02C** *3/00*

U.S. Cl. 71—13 **1 Claim**



1. A method of producing soil conditioners from waste material, and of utilizing the internal energy thereof, while reducing the volume of the waste material at the same time, wherein initial compacts of a refuse-sewage sludge mixture are subjected to intense rotting whereby the water content thereof is reduced from a value from about 50 to 60% to about 20%, and the compacts become dried and storable, comprising the steps of:

grinding and screening the dried and storable compacts, with a screen to form a coarse fraction remaining as oversize on the screen and a screened-out fine fraction;

the screened-out fine fraction being directly usable as a soil conditioner;

newly compacting the coarse fraction remaining as oversize on the screen; and

thereafter thermally treating only the newly compacted coarse fraction by one of low-temperature carbonization and combustion.

4,420,321

PROCESS FOR REMOVAL OF CARBON BLACK FLOC ASSOCIATED WITH WET-PROCESS PHOSPHORIC ACID IN THE PRODUCTION OF FERTILIZERS

Joseph F. Wilson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 30, 1982, Ser. No. 429,739

Int. Cl.[3] **C05B** *11/00, 7/00;* **C01B** *25/16*

U.S. Cl. 71—43 **5 Claims**

1. A method for removing carbon floc from wet-process phosphoric acid during the conversion of said acid to liquid fertilizer by neutralization with ammonia, said method comprising contacting said wet-process phosphoric acid with ammonia in a pipe reactor at an elevated temperature in the range of about 400° to about 700° F. in the presence of a sufficient amount of oxidizing agent to provide a colorless solution.

4,420,322

HERBICIDAL ANTIDOTES

Reed A. Gray, Saratoga, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

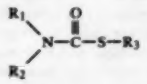
Filed Apr. 2, 1979, Ser. No. 26,112

Int. Cl.[3] **A01N** *25/32*

U.S. Cl. 71—82 **7 Claims**

1. In the method of controlling weeds in crops by applying to the soil in which crops have been planted

(a) an herbicidally effective amount of thiocarbamate herbicide of the formula



in which

R_1 is selected from the group consisting of 1 to 6 carbon alkyl and 2 to 6 carbon alkenyl;

R_2 is selected from the group consisting of 1 to 6 carbon alkyl, 2 to 6 carbon alkenyl, cyclohexyl and phenyl; or

R_1 and R_2 taken together with the nitrogen atom to which they are attached form hexahydro-1H-azepine; and

R_3 is selected from the group consisting of 1 to 6 carbon alkyl, 1 to 6 carbon haloalkyl, 5 to 10 carbon alkylene alkylene ring, phenyl and benzyl; whereby the improvement consists in reducing the injury to said crop by employing

(b) a non-phytotoxic antidotally effective amount of azide salt selected from the group consisting of alkali or alkaline earth elements or ammonium.

4,420,323

THIOPHOSPHORYL CARBAMATE HERBICIDE ANTIDOTES

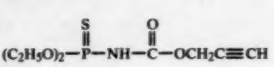
Edmund J. Gaughan, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 10, 1982, Ser. No. 376,489

Int. Cl.³ A01N *57/10, 37/00*

U.S. Cl. 71—87 **4 Claims**

1. The method of protecting a crop from injury due to the thiolcarbamate herbicide S-propyl N,N-dipropyl thiolcarbamate, comprising preplant incorporation in the soil treated with said herbicide in which said crop is to be planted, a nonphytotoxic antidotally effective amount of a compound corresponding to the formula



4,420,324

5-AMINO-1-DI-OR TRI-SUBSTITUTED PHENYLPYRAZOLE-4-CARBOXYLIC ACID METHYL ESTERS

Karl Eicken, Wachenheim; Peter Plath, Ludwigshafen, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Del.X

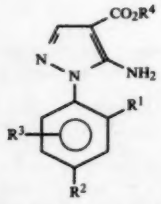
Filed Nov. 18, 1981, Ser. No. 322,673

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045903; Jul. 4, 1981, 3126479

Int. Cl.³ A01N *43/56*

U.S. Cl. 71—92 **4 Claims**

1. A 5-amino-1-phenylpyrazole-4-carboxylic acid ester of the formula



where R^1 is methyl, trifluoromethyl, chlorine or bromine, R^2 is chlorine, bromine, iodine or C_1–C_3-alkylsulfonyl, R^3 is hydrogen, chlorine or bromine, or is methoxy in the 5-position, in which case R^1 and R^2 are chlorine, whilst R^2 is hydrogen if R^3 is chlorine in the 3-position, and R^4 is methyl.

3. A herbicidal composition comprising a carrier and/or diluent and a herbicidal effective amount of a compound as defined in claim 1.

4,420,325

HERBICIDAL SULFONAMIDES

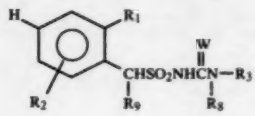
Richard F. Sauers, Hockessin, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 306,212, Sep. 29, 1981, abandoned, which is a continuation-in-part of Ser. No. 203,638, Nov. 3, 1980, abandoned. This application Apr. 22, 1982, Ser. No. 370,138

Int. Cl.³ A01N *43/54, 43/66;* **C07D** *239/42*

U.S. Cl. 71—92 **38 Claims**

1. A compound of the formula:



wherein

R_1 is F, Cl, Br, CF_3, C_1–C_3 alkoxy, C_1–C_3 alkyl, NO_2, CO_2R_4, SO_2R_5, $SO_2NR_6R_7$, $SO_2N(OCH_3)CH_3$, $SO_2OCH_2CF_3$, OSO_2R_5 or CH_2L;

L is $SO_2NR_6R_7$, OCH_3, OC_2H_5, CO_2CH_3 or $CO_2C_2H_5$;

R_2 is H, Cl, Br, F, CF_3 or OCH_3;

R_4 is C_1–C_3 alkyl, $CH_2CH{=}CH_2$, CH_2CH_2Cl, or $CH_2CH_2OCH_3$;

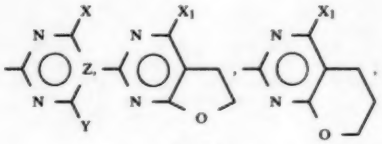
R_5 is C_1–C_3 alkyl or CF_3;

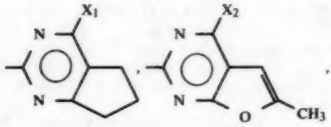
R_6 and R_7 are independently C_1–C_3 alkyl;

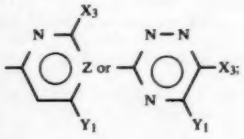
R_8 is H or CH_3;

R_9 is H or C_1–C_3 alkyl;

R_3 is







W is O or S;

X is CH_3, OCH_3 or Cl;

Y is CH_3, C_2H_5, OCH_3, OC_2H_5, CH_2OCH_3, NH_2, $NHCH_3$ or $N(CH_3)_2$;

Z is CH or N;

X_1 is H, Cl, CH_3, OCH_3 or OC_2H_5;

X_2 is CH_3, C_2H_5, OCH_3 or OC_2H_5;

X_3 is CH_3 or OCH_3; and

Y_1 is CH_3 or OCH_3; and their agriculturally suitable salts; provided that:

(1) when W is S, then R_8 is H;

(2) the total number of carbon atoms of R_6 and R_7 is less than or equal to 4; and

(3) when X is Cl, then Z is CH and Y is NH_2, $NHCH_3$, $N(CH_3)_2$ or OCH_3.

20. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,420,326

SYNERGISTIC HERBICIDAL COMPOSITION

Allyn R. Bell, Cheshire, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 972,584, Dec. 22, 1978, abandoned. This application May 2, 1980, Ser. No. 145,960

Int. Cl.³ A01N *43/64, 43/40*

U.S. Cl. 71—93 10 Claims

1. A herbicidal composition consisting essentially of a herbicidally effective amount of

(a) 2-(1-(2,5-dimethylphenyl)ethylsulfonyl)pyridine N-oxide,

(b) 4-amino-6-tert.-butyl-3-(methylthio)-1,2,4-triazin-5 4(H)one, and

(c) an intert diluent selected from liquid carriers, solid carriers and mixtures thereof;

wherein the ratio of (a)/(b) is 0.5/1 to 4/1 by weight.

4,420,327

TETRAHYDROPHTHALIMIDES AND HERBICIDAL COMPOSITION

Tetsuo Jikihara, Kawasaki; Masatsugu Oda, Yokohama; Kazuyuki Ushinohama, Yokohama; Hisao Watanabe, Yokohama, and Seiichi Suzuki, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

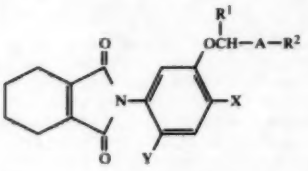
Filed Oct. 5, 1981, Ser. No. 308,824

Claims priority, application Japan, Oct. 7, 1980, 55-140074; Oct. 9, 1980, 55-141777

Int. Cl.³ A01N *43/38;* C07D *209/48*

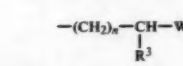
U.S. Cl. 71—96 31 Claims

1. A 3,4,5,6-tetrahydrophthalimide of the formula:

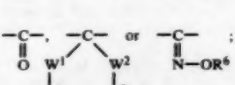


(I)

wherein X represents hydrogen or halogen; Y represents hydrogen or halogen; R^1 represents hydrogen or a C_{1-8} alkyl group; R^2 represents hydrogen or a C_{1-4} alkyl or phenyl group or R^1 and R^2, when bonded directly together, complete a cyclic radical with the R^1 bonded R^2 portion of the cyclic radical being a radical of the formula:



R^3 represents hydrogen or a lower alkyl group; W represents —O— or $—CH_2—$; n is 1 or 2, A represents



W^1 and W^2 each represents —O— or —S—; R^4 and R^5 may be the same or different and each represents a C_{1-4} alkyl group or R^4 and R^5 when bonded directly together complete a lower alkylene group; R^6 represents hydrogen, a C_{1-6} alkyl, a lower alkenyl, a lower alkynyl, a carboxyl-acyl, a C_{2-5} alkoxycarbonyl, carbamoyl, methylcarbamoyl, dimethylcarbamoyl, ethylcarbamoyl, diethylcarbamoyl, butylmethylcarbamoyl, ethylbutylcarbamoyl or a phenylcarbamoyl group.

9. A herbicidal composition, which comprises: a herbicidally effective amount of compound (I) of claim 1 as an active ingredient and a carrier.

4,420,328

DERIVATIVES OF 5-(PYRIDYL-2-OXY)-2-NITROBENZOIC ACID, AND HERBICIDAL COMPOSITIONS CONTAINING THEM

Hermann Rempfler, Ettingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 174,985, Aug. 4, 1980, Pat. No. 4,326,880. This application Jan. 26, 1982, Ser. No. 342,879

Claims priority, application Switzerland, Aug. 4, 1980, 7430/79

Int. Cl.³ C07D *213/64;* A01N *43/40*

U.S. Cl. 71—94 9 Claims

1. A compound of the formula

in which,

X is trifluoromethyl, fluorodichloromethyl or chlorine,

Y is trifluoromethyl or chlorine, and

R_1 is C_1 or C_2 alkylene substituted by methoxycarbonyl or ethoxycarbonyl.

5. A herbicidal composition which comprises, as active ingredient, an effective amount of a 5-(pyridyl-2'-oxy)-2-nitrobenzoic acid derivative according to claim 1 and a herbicidally acceptable carrier.

4,420,329

STABLE COLLOIDAL DISPERSIONS OF TRIACONTANOL

Robert G. Laughlin, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 273,524, Jun. 15, 1981, abandoned. This application Nov. 9, 1981, Ser. No. 319,565

Int. Cl.³ A01N *31/02*

U.S. Cl. 71—122 25 Claims

1. A stable colloidal dispersion comprising:

(a) from about 10^{-10} g/l to about 0.5 g/l of 1-triacontanol having a mean particle radius of less than about 0.3 microns, and

(b) water.

4,420,330

STABILIZATION OF PYROPHORIC FERROMAGNETIC ACICULAR METAL PARTICLES CONSISTING ESSENTIALLY OF IRON

Helmut Jakusch, Frankenthal; Werner Loeser, Ludwigshafen; Eberhard Koester, Frankenthal; Peter Rudolf, Neuhofen; Werner Senkpiel, Laudenbach, and Werner Stock, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 16, 1982, Ser. No. 368,984

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1981, 3116489

Int. Cl.³ C22C *1/04*

U.S. Cl. 75—0.5 AA 4 Claims

1. A process for stabilizing pyrophoric acicular ferromagnetic metal particles consisting essentially of iron, by reaction with oxygen-containing gases, wherein, in a first stage at from 25° to 45° C., up to ½ of the passivating layer present in the final state is formed and thereafter, in a second stage at from 50° to 70° C., the pyrophoric particles are treated with an oxygen-containing inert gas until the entire passivating layer has

formed, the temperature range for each stage being controlled by means of the oxygen content of the inert gas stream.

4,420,331
PROCESS FOR THE REMOVAL OF ARSENIC COMPOUNDS FROM TUNGSTEN OR MOLYBDENUM CONCENTRATES

Jan P. van't Sant, Westervoort, and Arjen Nieuwhof, Arnhem, both of Netherlands, assignors to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Jan. 21, 1982, Ser. No. 341,417

Claims priority, application Netherlands, Feb. 12, 1981, 8100668

Int. Cl.³ C22B *1/11, 1/12;* C01G *39/00, 41/00*

U.S. Cl. 75—6 **1 Claim**

1. A process for removing loellingite and arsenopyrite from an ore comprising molybdenite and iron tungstate which comprises subjecting the ore in a finely ground state to selective flotation yielding a product stream basically comprising molybdenite and another product stream basically comprising iron tungstate, subjecting the molybdenite stream to flotation yielding a molybdenite concentrate comprising loellingite and arsenopyrite impurities, subjecting the molybdenite concentrate to extraction with an aqueous solution of a ferric compound at a pH below 2.5 and a temperature of at least 60° C. and recovering a purified molybdenite comprising less than 800 ppm of arsenic, subjecting the iron tungstate product stream to leaching with a strong acid, to lower the content of iron compounds in this product stream, subjecting the leached product stream to magnetic separation yielding an iron tungstate concentrate having a reduced iron content and a solution of an iron salt, subjecting the iron tungstate concentrate to extraction with an aqueous solution of a ferric compound at a pH below 2.5 and a temperature of at least 60° C. and recovering a purified iron tungstate comprising less than 2000 ppm of arsenic.

4,420,332
PROCESS FOR THE PRODUCTION OF REDUCED IRON AND THERMAL CRACKING OF HEAVY OILS

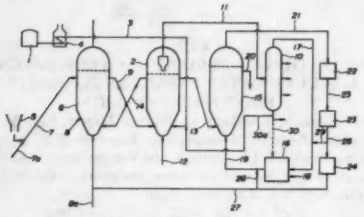
Kenji Mori; Kiichi Narita; Ryuzo Ijiri; Tsuneo Morimitsu; Dentaro Kaneko, all of Kobe; Nobuo Uemura, Nishinomiya; Yoshifumi Kameoka, and Mamoru Taniuchi, both of Kobe, all of Japan, assignors to Research Association for Residual Oil Processing, Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 329,033

Claims priority, application Japan, Dec. 22, 1980, 55-182441

Int. Cl.³ C21B *13/02*

U.S. Cl. 75—26 **26 Claims**



1. A process for concurrently carrying out production of reduced iron and thermal cracking of a heavy oil which comprises the steps of

(a) introducing a fine iron ore and a heavy oil into a fluidized-bed thermal cracking reactor to effect thermal cracking of the heavy oil at a temperature in the range of 500° to 600° C. into products of thermal cracking and carbonaceous by-product material which is deposited on the particles of the fine iron ore; said heavy oil being a vacuum distillation residue oil having a Conradson carbon value of 5 to 35% and a specific gravity of 0.9 to 1.10, and said fine iron ore being in the form of particles having an average diameter of about 10–30 μm,

(b) introducing the fine iron ore with deposits of said carbonaceous material formed in the step (a) into a first fluidized-bed reducing furnace and contacting a reducing gas at high temperature blown thereinto in a fluidized state to reduce the fine iron ore into reduced iron at a temperature in the range from 800° to 1000° C. and to form an exhaust gas,

(c) separating a cracked gas, light oil and residual oil by distillation from said products of thermal cracking formed in the step (a) in a fractionation system,

(d) transferring a part of said reduced iron formed in step (b) to a gas reformer and forming a fluidized-bed of said transferred reduced iron in said gas reformer and reforming said cracked gas or said residual oil by contact with the fluidized reduced iron in said gas reformer into a reducing gas mainly composed of hydrogen and carbon monoxide, and

(e) blowing the reducing gas into the fluidized-bed reducing furnace.

4,420,333
POWDERY DESULFURIZER COMPOSITION

Atsushi Takahashi, Tokyo; Yoshiharu Muratsubaki, Uozu, and Hiroyuki Ishizaka, Mitaka, all of Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1981, Ser. No. 260,884

Claims priority, application Japan, May 10, 1980, 55-61261

The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.³ C21C *7/02*

U.S. Cl. 75—55 **10 Claims**

1. A powdery desulfurizer composition for injection desulfurization of molten iron, said composition consisting essentially of 30 to 90% by weight of quicklime and 70 to 10% by weight of diamide lime, wherein the quicklime is obtained by calcining diamide lime under an oxygen-excessive atmosphere under conditions such that at least some calcium carbonate and at least some carbon remains in the quicklime, and not more than 20 parts by weight of a carbonaceous material and not more than 8 parts by weight of a desulfurization aid, each per 100 parts by weight of the quicklime and diamide lime, said composition being further characterized by its capability to be transported by a carrier gas at an amount of carrier gas of 6 Nl/Kg or less and by its capability to desulfurize molten iron in an injection desulfurization process using an amount of carrier gas of 6 Nl/Kg or less at a desulfurization ratio of at least about 55%.

4,420,334
METHOD FOR CONTROLLING THE BOTTOM-BLOWING GAS IN TOP-AND-BOTTOM BLOWN CONVERTER STEEL MAKING

Yoshiei Kato; Kyoji Nakanishi, and Tsutomu Nozaki, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

PCT No. PCT/JP81/00240, § 371 Date May 17, 1982, § 102(e) Date May 17, 1982, PCT Pub. No. WO82/01013, PCT Pub. Date Apr. 1, 1982

PCT Filed Sep. 19, 1981, Ser. No. 385,408

Claims priority, application Japan, Sep. 19, 1980, 55-131403

Int. Cl.³ C21C *5/32, 5/34*

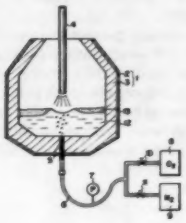
U.S. Cl. 75—60 **4 Claims**

1. In top and bottom blown converter steel making wherein an oxidizing gas is blown onto the surface of a molten iron in the converter through a lance disposed above the molten iron surface while a bottom blowing gas is blown through at least one single pipe bottom blowing tuyere in the bottom of the converter, a method of controlling the bottom blowing gas for

avoiding buildup of iron on the tuyere and burn back of the tuyere, comprising:

detecting the pressure of the bottom blowing gas supplied into said bottom blowing tuyere; and

when the bottom blowing gas is an inert gas and the pressure of the inert gas rises and is detected as reaching the upper limit of a predetermined pressure range, changing the gas



supplied to the bottom blowing tuyere to an oxidizing gas containing at least 60% of oxygen gas; and

when the pressure of the thus supplied oxidizing gas drops and is detected as reaching the lower limit of said predetermined pressure range, changing the gas supplied to the bottom blowing tuyere back to the inert gas, thereby alternately supplying the oxidizing gas and the inert gas to the bottom blowing tuyere.

4,420,335

MATERIALS FOR ROLLS

Tomio Takagi, Osaka; Jitsuhiko Ueda, Kobe; Tadaomi Fujii, Nara, and Kazuhiko Tanaka, Osaka, all of Japan, assignors to Hitachi Shipbuilding & Engineering Company Limited, Osaka, Japan

Filed Jan. 6, 1982, Ser. No. 337,472

Claims priority, application Japan, Feb. 5, 1981, 56-16513

Int. Cl.³ C22C *38/06*

U.S. Cl. 75—124 **12 Claims**

1. A roll material comprising, in proportions by weight, 0.04–0.20% C, 0.2–0.8% Si, 0.4–1.5% Mn, 0.2–1.0% Ni, 10.0–14.0% Cr, 0.5–4% Cu, 0.1–0.5% V, 0.01–0.35% Nb, 0.01–0.06% Al, P and S each in a reduced amount of up to 0.03% as impurity elements, and the balance Fe.

4,420,336

PROCESS OF IMPROVING CORROSION RESISTANCE IN POROUS STAINLESS STEEL BODIES AND ARTICLE

Erhard Klar, Beachwood, and Mary A. Pao, Concord, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Feb. 11, 1982, Ser. No. 347,954

Int. Cl.³ B22F *1/00*

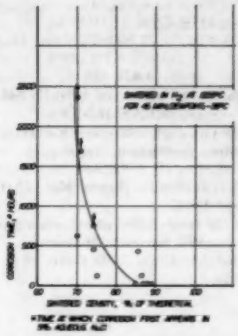
U.S. Cl. 75—246 **6 Claims**

1. A foraminous body having improved corrosion resistance to aqueous nitric acid, 10%, and being formed of tin-containing water atomized, compacted and sintered austenitic stainless steel alloy powder compacted and sintered to less than 80% of theoretical density and characterized by being formed of a prealloyed stainless steel alloy powder containing from 0.1% to 10% by weight of tin.

4. A process for improving the corrosion resistance to aqueous nitric acid, 10%, of austenitic stainless steel foraminous body comprising:

(a) compacting water atomized austenitic stainless steel alloy powder in the form of said foraminous body and containing from 0.1% to 10% by weight of prealloyed tin to form a compact;

(b) sintering the compact in a dissociated ammonia or synthetic nitrogen atmosphere at a temperature of at least about 1125° C. to a final density less than 80% of theoretical density; and



(c) cooling the sintered compact in a dissociated ammonia atmosphere.

4,420,337

BISMUTH INHIBITORS FOR ACID GAS CONDITIONING SOLUTIONS

Billy D. Oakes, Lake Jackson; Michael S. Dupart, Alvin, both of Tex., and David C. Cringle, Melbourne, Australia, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 1, 1982, Ser. No. 394,209

Int. Cl.³ C09K *3/00*

U.S. Cl. 106—14.15 **4 Claims**

1. A corrosion inhibited composition useful to inhibit corrosion in stainless steel acid gas removal equipment which comprises

(A) an aqueous alkanolamine solution, and

(B) a corrosion effective amount of a soluble bismuth compound in the trivalent state.

4,420,338

SCREEN-PRINTING INK

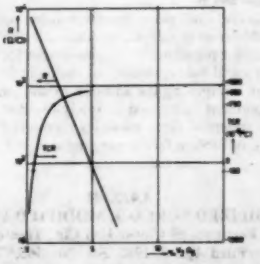
Francis Ortega, Brunoy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 15, 1981, Ser. No. 302,280

Claims priority, application France, Sep. 15, 1980, 80 19851

Int. Cl.³ C09D *11/02*

U.S. Cl. 106—20 **9 Claims**



1. A screen-printing ink for producing a TCR modifier containing resistor by firing in a neutral atmosphere, said ink comprising a mixture of one or more metalhexaborides, a temporary binder and a glass as the permanent binder, characterized in that the glass is an alkaline earth metal borate consisting of an alkaline earth metal oxide and boron oxide or an alkaline earth metal silicoborate consisting of an alkaline earth

metal oxide, boron oxide and silicon dioxide which glass is modified by a quantity of not more than 5 mole% of one or more metal oxides selected from the group consisting of oxides of vanadium, molybdenum, niobium, tungsten, manganese, iron, zirconium and tantalum.

4,420,339

COLLAGEN FIBERS FOR USE IN MEDICAL TREATMENTS

Tadaaki Kato, Tokyo, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

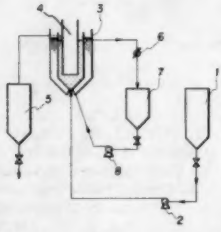
Filed Mar. 18, 1982, Ser. No. 359,309

Claims priority, application Japan, Mar. 27, 1981, 56-46021; Mar. 27, 1981, 56-46022

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.³ C07G *7/00*; C08L *89/06*

U.S. Cl. 106—124 **6 Claims**



1. Collagen fibers for use in medical treatments, having amino acid residues of 312 to 340 glycine residues, 119 to 138 proline residues, 94 to 100 hydroxyproline residues and 2.6 to 5.5 tyrosin residues per 1000 total amino acid residues thereof, a denaturation temperature in a range of 31° to 40° C., and S-constant of 1.12 to 1.62.

4,420,340

COLOR RETENTION PIGMENT FOR PAINT COMPOSITIONS USING LATEX VEHICLES

Bernard Mohr, Louisville, Ky.; Nicholas J. Pappas, Somers; Kuldip S. Chopra, Grand Island, both of N.Y., and George A. Salensky, Whitehouse Station, N.J., assignors to Elkem Metals Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 343,550, Jan. 28, 1982, abandoned. This application Nov. 10, 1982, Ser. No. 440,573

Int. Cl.³ C09D *5/02*

U.S. Cl. 106—288 B **7 Claims**

1. In a conventional water emulsion paint composition containing predominately acrylic emulsion, a thickener, dispersants and a color pigment; the improvement for enhancing the color stability and fade resistance of the paint formulation, said improvement comprising the addition to said paint formulation of a color pigment composed of finely-divided manganomanganic oxide spherical fume particles recovered from the oxygen blowing of molten ferro-manganese.

4,420,341

STABILIZED SURFACE MODIFIED FILLERS

Thomas H. Ferrigno, 29 Clover Hill Cir., Trenton, N.J. 08638

Filed Apr. 5, 1982, Ser. No. 365,673

Int. Cl.³ C09C *1/42*

U.S. Cl. 106—308 Q **11 Claims**

1. A stabilized surface modified filler consisting of:

(a) an organic acid reactive filler selected from the group consisting of calcite, aragonite, amphiboles including tremolite, anthophyllite, and actinolite, brucite, antigorite, talc, chlorite, wollastonite, gibbsite, diaspore, boehmite and mixtures thereof having a size range of from 100 percent minus 10 mesh U.S. Standard sieves to about 0.07 micrometers equivalent spherical diameter;

(b) an organic acid selected from the group consisting of organic acids having 3 to 24 carbon atoms and zero to 5 double bonds including cyclic rosin acids, isostearic, ricinoleic, licanic and diacids maleic and itaconic and mixtures thereof such that the molar ratio is at least one of unsaturated acid to 4 of saturated acid to entirely unsaturated acid, present from about 0.1 to 10 percent by weight of the filler;

(c) an antioxidant present from about 0.005 to 0.1 percent based on the weight of the filler; and

(d) a liquid agent present from 0 to about 100% based on weight of the organic acid, being liquid at about 15°–55° C. and having boiling points above about 200° C. at atmospheric pressure and substantially non-reactive with said organic acid below about 120° C.

4,420,342

METHOD OF PREVENTION OF DEPOSITS IN THE PIPES OF WASTE HEAT BOILERS

Hans Gettert, Gross-Sachsen, and Knut Kaempfer, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,197

Int. Cl.³ C23G *1/02*

U.S. Cl. 134—3 **4 Claims**

1. A process for preventing nickel, iron and vanadium deposits in the pipes of waste heat boilers employed for cooling gases which are formed by partially oxidizing metal and chloride-containing fossil fuel with more than 2 weight percent sulfur, wherein the pipes are flushed, at the operating temperature, with hydrogen-containing gases which contain little or no H_2S.

4,420,343

PROCESS FOR THE THERMAL DECOKING OF CRACKED GAS COOLERS

Artur Sliwka, Kirchheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 237,963

Int. Cl.³ B08B *9/02*

U.S. Cl. 134—22.15 **2 Claims**

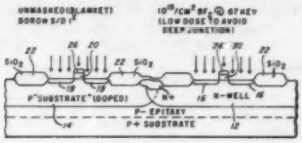
1. A process for the thermal decoking of cracked gas coolers for the indirect cooling, by means of water, of ethylene-containing cracked gases which are obtained by thermal cracking of hydrocarbons in the presence of steam in an indirectly heated tube cracking furnace at cracked gas exit temperatures of above 750° C., which process comprises: stopping the introduction of the hydrocarbon to be cracked to the cracking furnace, and passing a steam/air mixture through the indirectly heated cracking tubes of the furnace and at the same time through the downstream cracked gas cooler and, after completion of decoking of the cracking tubes of the furnace, stopping the supply of steam and thereafter passing only heated air or an air/oxygen mixture through the indirectly heated cracking tubes of the tube cracking furnace in such an amount that the ratio of the hourly weight throughput of heated air or heated air/oxygen mixture to the hourly throughput of hydrocarbon during thermal cracking is from 0.1 to 3, such air or air/oxygen mixture being heated to temperatures of from 600°to 1,100° C. and passing the heated air or air/oxygen mixture through the cracked gas cooler tubes which are to be decoked for a sufficient period to substantially decoke said cooler tubes and maintaining at the same time a steam pressure of at least 90 bar on the boiling water side of the cracked gas cooler.

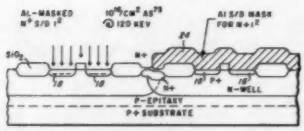
4,420,344

CMOS SOURCE/DRAIN IMPLANT PROCESS WITHOUT COMPENSATION OF POLYSILICON DOPING

Roderick D. Davies, Richardson, and David B. Scott, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 15, 1981, Ser. No. 311,713
Int. Cl.³ H01L 21/263, 21/26
U.S. Cl. 148—1.5 7 Claims





1. A process for forming both first-conductivity-type-channel and second-conductivity-type-channel transistors in respective selected areas of a semiconductor surface, said transistors each respectively comprising a gate, a source, and a drain, said process comprising the steps of:

providing a layer of doped first-conductivity-type polysilicon atop said semiconductor surface;

applying a patterned etch mask layer atop said polysilicon layer, said patterned etch mask layer overlying the respective selected locations of said respective gates of said transistors;

anisotropically etching said polysilicon layer except where said polysilicon layer is covered by a portion of said patterned etch mask layer;

implanting a second-conductivity-type dopant in the respective desired locations both of the respective sources and drains both of said second-conductivity-type-channel transistors and one of said first-conductivity-type-channel transistors, said patterned etch mask layer not being removed before said second-type implanting step; and

implanting a first-conductivity-type dopant in the respective desired locations of said respective sources and drains of said first-type-channel transistors, said first-type dopant being applied at a higher dose than said second-type dopant;

wherein said first- and second-type dopants are such that the presence of said first-type dopant within said semiconductor surface reduces the diffusivity of said second-type dopant.

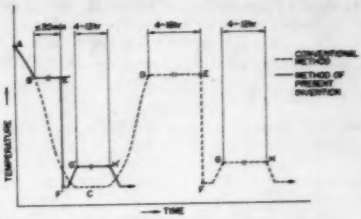
4,420,345

METHOD FOR MANUFACTURE OF ALUMINUM ALLOY CASTING

Tadao Ito, Fuji, and Akio Hashimoto, Numazu, both of Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,881
Int. Cl.³ C22F 1/04
U.S. Cl. 148—3 3 Claims

1. A method for the manufacture of cast articles of aluminum alloy, which comprises the steps of (1) pouring into a metal mold a molten Al-Si-Mg type casting alloy containing antimony (Sb) in the range of 0.03 to 1.0% by weight; (2) after complete solidification of the cast body within the mold but before said cast body has cooled below about 450° C., placing said cast body in a heating furnace kept at temperatures in the range of from 500° to 550° C. for about 5–30 minutes; (3) then



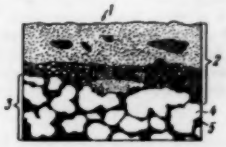
quenching the cast body in cold water or warm water; and (4) subjecting the quenched cast body to a conventional artificial aging treatment.

4,420,346

METHOD OF PREPARING CONTACTS AND ELECTRODES OF ELECTRIC VACUUM APPARATUSES

German S. Belkin, ulitsa 1 Maya, 1, kv. 46, Zheleznodorzhry, Moskovskaya oblast; Stal N. Voskresensky, Angarskaya ulitsa, 49, korpus 1, kv. 22, Moscow; Viktor Y. Kiselev, Perovskaya ulitsa 40, korpus 4, kv, 12, Moscow; Ida A. Lukatskaya, ulitsa Moldagulovoi, 28 korpus 3, kv. 68, Moscow; Valery V. Rodionov, ulitsa Metallurgov, 41-b, kv. 22, Tula; Mikhail N. Skurikhin, Martenovskava ulitsa, 21/12, kv. 1, Tula; Irina B. Frolova, ulitsa Metallurgov. 43-a, kv. 69, Tula; Vyacheslav S. Znev, ulitsa Bratiev Zhabrovykh, 32, kv. 160, Tula; Lev I. Kornevv, ulitsa Anosova, 8/16, kv. 1, Tula; Rauza A. Chervonenkis, ulitsa Butlerova, 26, korpus 2, kv. 33, Moscow; Efim M. Rabinovich, ulitsa Metallurgov, 35/7, kv. 35, Tula; Tatyana P. Volkova, ulitsa Chaplygina, 619 kv, 21, Tula, and German A. Goryaev, Priupskaya ulitsa, 9-a, kv. 85, Tula, all of U.S.S.R.

PCT No. PCT/SU80/00187, § 371 Date Jul. 16, 1982, § 102(e) Date Jul. 16, 1982, PCT Pub. No. WO82/01960, PCT Pub. Date Jun. 10, 1982
PCT Filed Nov. 28, 1980, Ser. No. 403,648
Int. Cl.³ C25D 5/34
U.S. Cl. 148—4 1 Claim

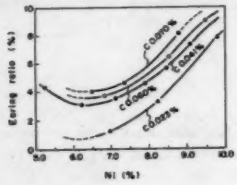


1. A method of preparing contacts and electrodes of electric vacuum apparatuses comprising the steps of exposing the surface of the contacts (electrodes) to a concentrated thermal flux of 10^4 to 10^6 W/cm^2 in a vacuum or in the atmosphere of an inert gas and subjecting said surface to subsequent cooling, said concentrated thermal flux is applied for 21 to 100 ms and a rate of cooling during the cooling step is chosen to be within the range 10^4 to 10^6 K/s.

4,420,347
PROCESS FOR PRODUCING AN AUSTENITIC STAINLESS STEEL SHEET OR STRIP

Masanori Ueda, Kitakyusyushi; Hidehiko Sumitomo, and Hirofumi Yoshimura, both of Hikarishi, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,876
Claims priority, application Japan, Jul. 31, 1981, 56-120068
Int. Cl.³ C21D *7/02*
U.S. Cl. 148—12 E **4 Claims**



1. A process for producing a sheet or strip of an austenitic stainless steel, comprising:

casting a slab from a molten steel containing, by weight, up to 0.070% carbon, up to 1.0% silicon, up to 3.0% manganese, up to 0.040% phosphorus, up to 0.030% sulfur, 16.0 to 19.0% chromium, 6.0 to 9.0% nickel and up to 0.2% nitrogen, the percentages of carbon and nickel satisfying the following relationship:

$$(102 \times \text{carbon } \%) + (4 \times \text{nickel } \%) \leqq 39.5\%;$$

hot rolling said slab;
descaling said hot rolled steel;
cold rolling said steel; and
annealing said cold rolled steel.

4,420,348
AMORPHOUS ALLOY FOR MAGNETIC HEAD CORE

Kazuo Shiiki, Kanagawa; Shigekazu Otomo, Hachioji; Mitsuhiro Kudo, Hamuramachi, and Mitsuo Abe, Yokohama, all of Japan, assignors to Hitachi, Ltd.; Hitachi Metals, Ltd. and Research Development Corporation of Japan, all of Tokyo, Japan

Filed Mar. 27, 1981, Ser. No. 248,456
Claims priority, application Japan, Mar. 28, 1980, 55/38888
Int. Cl.³ C22C *33/00*
U.S. Cl. 148—403 **6 Claims**

1. Amorphous alloy for magnetic head core, represented by the general formula:

$$(Fe_xCo_{1-x})_aCr_bSi_cB_{1-a-b-c}$$

wherein the value of x is 0.04–0.07, the value of a is 0.73–0.75, the value of b is 0.005–0.03, and the value of c is 0.02–0.06, whereby said alloy has a saturation flux density of 8 kG or higher, permeability of more than 5000 at 20 kHz and magnetostriction of less than 10^{-6} such that said alloy can be utilized for magnetic head cores.

4,420,349
EMULSION EXPLOSIVE COMPOSITIONS AND METHOD OF PREPARATION

Howard A. Bampfield, Otterburn Park, Canada, assignor to C-I-L Inc., North York, Ontario, Canada

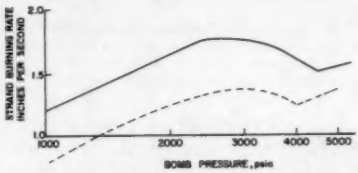
Filed Jan. 10, 1983, Ser. No. 456,843
Claims priority, application Canada, Feb. 2, 1982, 395372
Int. Cl.³ C06B *45/00*
U.S. Cl. 149—2 **8 Claims**

1. A thermally and storage stable water-in-oilemulsion explosive of putty-like consistency comprising a water-immiscible liquid organic fuel continuous phase, an aqueous inorganic oxidizer salt solution discontinuous phase and from 0.5 to 4% by weight of the total composition of a dimer acid glyceride as emulsifier wherein the dimer acid has a carbon atom chain length of C_{18}–C_{60}.

4,420,350
DOUBLEBASE BALLISTIC MODIFIERS

Albert T. Camp, Welcome, Md., and Elmer R. Csanady, Hedgesville, W. Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 2, 1980, Ser. No. 155,894
Int. Cl.³ C06B *25/26*
U.S. Cl. 149—98 **14 Claims**



1. In a double base propellant comprising an energetic polymer and an energetic plasticizer, the improvement comprising the addition, based on total weight of propellant, from about 0.2 to 7 weight percent of a first ballistic modifier selected from the class consisting of copper, lead, tin, and bismuth chelates of a substituted hydroxybenzophenone selected from the class consisting of, 2-hydroxy4-alkoxybenzophenone, and 2,2'-dihydroxy-4,4'-dialkoxybenzophenone, and mixtures thereof.

4,420,351
METHOD OF MAKING DECORATIVE LAMINATED PRODUCTS SUCH AS TILES, PANELS OR WEBS FROM CELLULOSIC MATERIALS

Eduard Lussi; Ulf L. Ahlstedt, and Sven A. Ryden, all of Ronneby, Sweden, assignors to Tarkett AB, Ronneby, Sweden

Filed Apr. 29, 1982, Ser. No. 373,165
Int. Cl.³ B32B *31/12, 31/20, 31/26*
U.S. Cl. 156—62.4 **6 Claims**

1. A method of making decorative laminated products, such as tiles, panels or webs, which comprises the steps of granulating a cellulosic material, mixing the granulate with a fusible plastics and making a mat therefrom, cutting from a cellulosic material thin slices which in the state obtained with the through holes and recesses therein are placed on the mat thus made, applying a film of fusible plastics onthe thin slices of cellulosic material, and compressing the laminate thus obtained under supply of heat for melting the plastics and urging the material of the mat into the holes and recesses of the slice, and then cooling the compressed tile.

3. A method as claimed in claim **1** including the further step of subjecting the tile after cooling to free heating and cooling for relief formation of the plastics film.

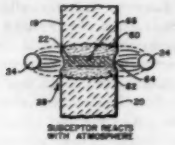
4,420,352
ABSORBABLE-SUSCEPTOR JOINING OF CERAMIC SURFACES

James E. Schroeder, Claremont, and Paul J. Shlichta, San Pedro, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 10, 1983, Ser. No. 465,367
Int. Cl.³ C03B *29/00*; C04B *33/34, 37/00*
U.S. Cl. 156—89 **14 Claims**

1. A method of joining ceramic surfaces comprising the steps of:

placing a thin film of metal susceptor material at the interface between the surfaces to form an abutting assembly, said metal being reactive with a gas to form a compound soluble in the ceramic;



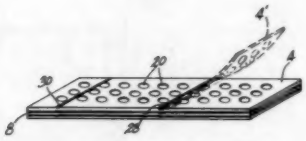
melting the film and adjacent zones of ceramic;
reacting the susceptor with a gas to form said compound;
dissolving said compound in the molten ceramic; and
cooling the assembly to form a joint.

4,420,353

METHOD OF MAKING A STOOL SAMPLING DEVICE

Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437

Continuation-in-part of Ser. No. 110,437, Jan. 7, 1980, Pat. No. 4,273,741, and Ser. No. 203,083, Nov. 3, 1980, Pat. No. 4,367,750. This application May 22, 1981, Ser. No. 266,151
Int. Cl.³ G01N *1/02, 33/52, 33/72*
U.S. Cl. 156—227 **3 Claims**



1. A method of forming a biological material sampling device, said method comprising the steps of:
(a) providing a first roll of a pliant impermeable material;
(b) providing a second roll of a pliant absorbent material;
(c) providing a third roll of a pliant screening material;
(d) feeding material from said first, second and third rolls into overlying relationship;
(e) applying strips of adhesive to edge portions of the surface of said pliant, impermeable material adjacent to said pliant absorbent material;
(f) applying strips of a releasable, reusable material to the edge portions of the surface of said pliant, absorbent material adjacent to said pliant screening material;
(g) bonding said pliant, impermeable material, said pliant, absorbent material and said pliant screening material to form a laminate;
(h) forming transverse fold lines on said laminate; and
(i) cutting said laminate transversely to form individual sampling devices.

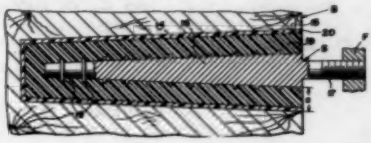
4,420,354

PROCESS FOR SECURING PROJECTING STUDS IN THE ENDS OF WOOD RESIN COMPOSITE BODIES AND THE LIKE AND THE STRUCTURE FORMED THEREBY

Meade A. Gougeon, and Jan C. Gougeon, both of Bay City, Mich., assignors to Gougeon Brothers, Inc., Bay City, Mich.

Filed Jun. 14, 1982, Ser. No. 387,930
Int. Cl.³ B29B *31/00*
U.S. Cl. 156—242 **12 Claims**

1. A process for securing projecting metallic studs in fixed located position in composite structures such as the ends of elongate hollow windmill blades wherein the blades have bonded synthetic plastic wood-resin composite bodies with an end plate formed by a block in which the studs are to be bonded, comprising the steps of:
a. roughing frustoconical-shaped plug bodies of the studs while substantially protecting threaded ends projecting therefrom;
b. casting frustoconical exothermically curing resin-hardener-filler sleeves of predetermined thickness around the plug body of each stud only, in a mold, while leaving the projecting threaded ends free of the resin;
c. curing the sleeves in the mold to harden them and then removing the studs from the mold with the hardened sleeves encapsulating them;



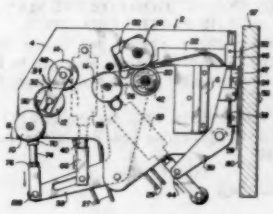
d. forming a plurality of frustoconical stud receiving openings in a predetermined pattern, in the block following the general configuration of the blade perimeter;
e. inserting the plug portions with encapsulated cured sleeves thereon into the openings and providing a more viscous coating of substantially lesser thickness than said sleeves of the same, or a compatible, resin between the internal walls of the openings and the sleeves;
f. locating the sleeves and the plugs in fixtured positions in the openings to protrude the threaded ends in predetermined projected position and relatively spaced apart positions; and
g. curing the coatings in situ with the release of insufficient heat to interfere with bonding of the coatings to both the sleeves and marginal walls of the openings.

4,420,355

RIBBON APPLICATOR HEAD

Walter Saur, Ditzingen, Fed. Rep. of Germany, assignor to Bedford Industries, Inc., Worthington, Minn. and Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 364,034
Int. Cl.³ B32B *31/18, 35/00*
U.S. Cl. 156—250 **16 Claims**



1. In an item processing machine having an adhering element, a supply of ribbon-like material and an applicator head for processing the ribbon-like material, wherein the applicator head includes:
an activator means connected to control operation of the applicator head;
a guide means for guiding the ribbon-like material;
a blade means for cutting the ribbon-like material;
an accumulating means connected to the activator means such that in a first state the accumulating means accumulates a pre-selected length of ribbon-like material, and

such that in a second state the accumulating means feeds the ribbon-like material to the guide means;

an applicating means positioned to receive the ribbon-like material from the guide means, and connected to the activator means to be activated by the activator means such that the applicating means engages the blade means to cut the ribbon-like material and presents the ribbon-like material to the adhering element, which adheres the ribbon-like material to the item.

4,420,356

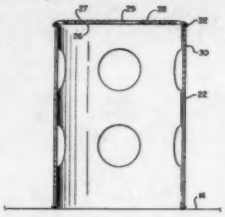
FLOTATION MATTRESS AND METHOD

Michael Carpenter, 227 Easton S., Laurel, Md. 20810

Division of Ser. No. 16,175, Feb. 28, 1979, Pat. No. 4,325,152. This application Mar. 3, 1982, Ser. No. 354,438

Int. Cl.³ B29C *27/04;* H05B *7/06*

U.S. Cl. 156—251 **9 Claims**



1. A method of manufacture of a floatation mattress having damping chambers disposed within the envelope comprising the steps of forming a cylinder of flexible liquid-impermeable sheet material having openings therein, placing the said cylinder of material inside a cylindrical mandrel of substantially the same outer profile as the said cylinder of material, placing the opposite edges of the opposing ends of said cylinder of material over the edges of said mandrel, placing a plurality of layers of an extent greater than the outer profile of the said cylinder of material over one end of said cylindrical mandrel, said plurality of layers having a buoyant material disposed between said layers, placing the said cylindrical mandrel on a bottom sheet of liquid-impermeable material, sealing one end of said cylinder of material to said bottom sheet and sealing said layers to the other end of said cylinder of material.

4,420,357

APPARATUS AND METHOD FOR THE MANUFACTURE OF PARTICLEBOARD

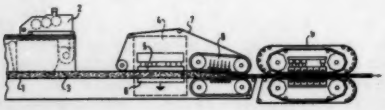
Harry Neubauer; Berndt Greten, and Günter Seeger, all of Springe, Fed. Rep. of Germany, assignors to Bison-Werke Bähre & Greten GmbH & Co. KG, Springe, Fed. Rep. of Germany

Filed Feb. 19, 1982, Ser. No. 350,552

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107589

Int. Cl.³ B29C *19/02*

U.S. Cl. 156—274.6 **20 Claims**



1. Apparatus for the continuous manufacture of boards from a mat of electrically poorly conducting material in the form of particles, fibers or the like, together with at least one heat hardenable binder dispersed therein, said apparatus comprising: at least one high frequency heating device having input and output ends and mutually spaced upper and lower stationary electrode plates defining a working gap; means for adjusting said upper electrode plate in a vertical direction to adjust said working gap and thus the capacitance of said high frequency heating device; an endless conveyor band for transporting the mat through said working gap from said input end to said output end between said mutually spaced electrode plates; a retaining band extending through said working gap and intended, in operation, to lie on the upper side of said conveyor band and retain said material in position on said mat; wherein the mutual spacing of the electrode plates is substantially equal to or less than the thickness of the mat at said input end, so that said mat passes without an air gap through said working gap with said retaining band grazingly contacting said upper electrode plate, and with said conveyor band grazingly contacting said lower electrode plate, and wherein said electrode plates are adapted to facilitate relative sliding movement of said conveyor band and said retaining band thereover.

4,420,358

APPARATUS FOR THE PRODUCTION OF A GLUED WOOD JOINT

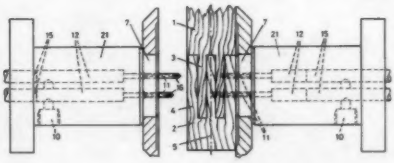
Emanuel Kindt, and Joachim Sautter, both of Otelfingen, Switzerland, assignors to E. Kindt AG, Otelfingen, Switzerland

Filed Sep. 23, 1981, Ser. No. 304,888

Claims priority, application Switzerland, Sep. 25, 1980, 7193/80

Int. Cl.³ B27G *11/00*

U.S. Cl. 156—356 **6 Claims**



1. An apparatus for a glued wood joint having flat surfaces comprising: means for tightly holding together the flat surfaces to be glued; at least one injection needle which can be driven into the wood, said needle having a solid needle tip and a side outlet opening through which adhesive can be delivered; a primary hydraulic means for driving said needle into the wood up to a depth at which the side outlet opening of the needle comes into contact with the flat surfaces; the needle having an axis which extends transverse to a plane of the flat surfaces; means for delivering a precise amount of fluid adhesive through the needle under pressure to distribute the adhesive between the surfaces, and means for automatically controlling the primary hydraulic means for driving the needle into the wood and the means for delivering a precise amount of fluid adhesive through the needle.

4,420,359

APPARATUS FOR PRODUCING FIBER-REINFORCED PLASTIC SHEET STRUCTURES

William B. Goldsworthy, Rancho Palos Verdes, Calif., assignor to Goldsworthy Engineering, Inc., Torrance, Calif.

Filed Aug. 5, 1981, Ser. No. 290,358

Int. Cl.³ B32B *35/00*

U.S. Cl. 156—379.8 **53 Claims**

1. Apparatus for producing a fiber reinforced plastic sheet laminate structure comprised of at least two laminable members, said apparatus comprising:

(a) means for bringing a first laminable member comprised of fiber reinforcing material into incidental relationship with common relatively flat surfaces of endwise abutted relatively rigid second laminable members,

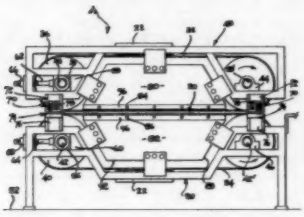
(b) first and second continuous belts, each of said belts hav-

ing a first surface and a second surface with the second surfaces of said belts having portions which are opposed and spaced apart from each other forming an opening there between for receiving said laminable members during movement of said members,

(c) a pair of separate housings with each forming a plenum chamber and each chamber having a wall facing the first surface of each of said belts and located so that each one of said belts surrounds and moves around an individual one of said housings,

(d) a continuous seal on said wall of each of said housings and extending toward the belt nearest that housing, said seals each having an end portion capable of engaging said first surface of said first and second belts in sliding engagement therewith to create a gas receiving area formed by said wall of each said housing and said belt surrounding that housing and said continuous seal on that housing,

(e) aperture means in said wall of each said housing permitting passage of a gas under pressure to form a body of gas in said gas receiving area adjacent the wall of each hous-



ing which bears against the first surface of said belts and urges said second surface of each of said belts into contact with said laminable members with relatively uniform pressure in said gas receiving areas to cause contact of opposed surfaces of said laminable members with relatively uniform pressure and thereby also enable a curing of a resin matrix impregnated in said reinforcing material and relatively uniform lamination of said laminable members, and

(f) separate driving means in advance of said belts for forceably driving said laminable members through said apparatus and by pushing the laminable members through the opening between said belts without any driving force created by said belts so that the laminable members are forced through said opening and engage and impart a driving force to said belts, but which belts nevertheless apply a laminating pressure to the laminable members therebetween, and thereby also permitting the belts surrounding the associated housings to be essentially floatable about the associated housings.

4,420,360

APPARATUS FOR THE INDUSTRIAL PRODUCTION OF FLOCK COATED ELECTRICAL WIRE

Claude Batisse, Berck Plage, France, assignor to Flocord S.A., Luxembourg

Filed Jul. 1, 1981, Ser. No. 279,306

Claims priority, application France, Jul. 2, 1980, 80 14771; Jun. 4, 1981, 81 11103

Int. Cl.³ H01B *13/16;* **B32B** *33/00*

U.S. Cl. 156—390 **7 Claims**

1. Apparatus for producing electrical conducting wire having a coating of flock, comprising

(a) first means for supporting the wire as the wire moves,

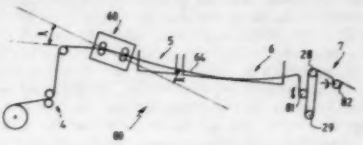
(b) means for coating the wire with an adhesive as the wire moves,

(c) means for depositing a coat of flock on the adhesive coated wire as the wire moves,

(d) heating means for drying the flock coated wire as the wire moves,

(e) means for cooling and brushing the flock coated wire as the wire moves,

(f) second means for supporting the wire as the wire moves, the means specified in (b), (c), (d), and (e) above being



disposed between the first and second wire support means, and

(g) means for controlling the movement of the wire between the first and second wire support means whereby the moving wire is maintained in the free unsupported state therebetween.

4,420,361

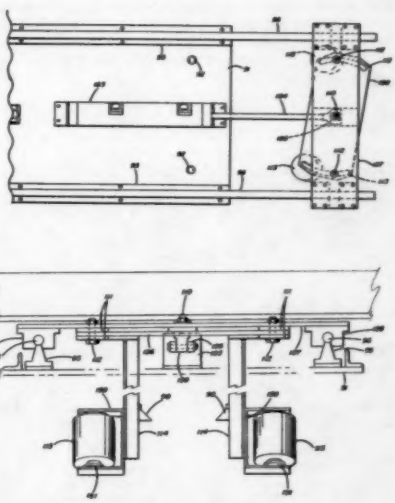
APPARATUS FOR ALIGNING BENT GLASS SHEETS FOR ASSEMBLY INTO BENT GLASS SHEET SANDWICHES

James L. Valimont, Cheswick, and Barry L. Shadle, Leechburg, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 287,608, Jul. 28, 1981, Pat. No. 4,367,107. This application Sep. 17, 1982, Ser. No. 419,271

Int. Cl.³ B32B *17/10, 17/04;* **B65H** *29/24*

U.S. Cl. 156—556 **16 Claims**



1. Apparatus for aligning and bonding a pair of bent glass sheets comprising an upper bent glass sheet and a lower bent glass sheet of matching concave elevational configuration at an assembly station comprising means for supporting said pair of bent glass sheets on a support at a lower level, means comprising a pair of transversely spaced, linear rotating rolls mounted for free rotation about oblique axes extending approximately parallel to the thickness of corresponding end edge surfaces adjacent thereto for engaging each of the opposite longitudinal end edge surfaces of said bent glass sheets at transversely

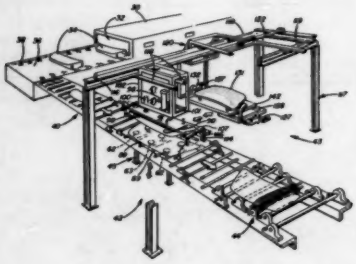
spaced portions at an upper level to align said glass sheets longitudinally of said assembly station, means including a pair of side edge aligning rolls for engaging each of the opposite side edges of said sheets at longitudinally spaced portions at a lower level to align said glass sheets transversely of said assembly station, means to retract said linear rotating rolls for disengaging said linear rotating rolls from engagement with said longitudinl end edge portions, a first set of vacuum cups, means to lift said first set of vacuum cups into position for lifting said bent glass sheets in unison from said support on said first set of vacuum cups while maintaining said side edge alignment rolls in engagement with said opposite side edge portions, a second set of vacuum cups, means to lower said second set of vacuum cups into position for engaging the top surface of the upper bent glass sheet of said pair with said second set of vacuum cups, means for applying vacuum to said cups to hold the engaged glass sheet surfaces thereagainst, means for separating said side edge alignment rolls from said side edges, means to separate said sets of vacuum cups from one another while applying vacuum thereto for separating said bent glass sheets in a direction of their thickness to form a gap between said glass sheets at said assembly station sufficiently wide for inserting a sheet of flexible interlayer material into said gap, means for inserting said sheet of flexible interlayer material into said gap into a position of alignment over said lower bent glass sheet and means urging said sets of vacuum cups toward one another for assembling said glass sheets to form a sandwich with said sheets of flexible interlayer material, and means to apply sufficient heat and pressure to laminate said sandwich.

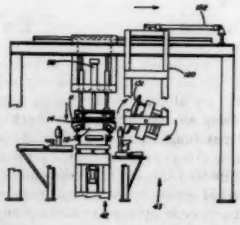
4,420,362

SHAPED MOLD AND A METHOD OF USING SAME TO ASSEMBLE SANDWICH OF A SHEET OF FLEXIBLE INTERLAYER MATERIAL WITH BENT GLASS SHEETS

James L. Valimont, Cheswick, and Hershel L. Phares, Apollo, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 287,607, Jul. 28, 1981, Pat. No. 4,366,013.
This application Sep. 20, 1982, Ser. No. 420,441
Int. Cl.³ B32B *17/04, 17/10;* B65H *29/24*
U.S. Cl. 156—563 7 Claims





1. Apparatus for assembling a sandwich comprising a pair of bent glass sheets of matching curvature comprising an upper bent glass sheet and a lower bent glass sheet shaped to a concave elevational configuration and a flexible sheet of interlayer material therebetween or for assembling a subassembly comprising said lower bent glass sheet and said flexible sheet comprising an assembly station,

a vacuum mold having an apertured first wall having a curved configuration conforming to the elevational configuration of said bent glass sheets,

means to deliver said pair of bent glass sheets in said concave elevational configuration to a vertically extending space within said assembly station,

means to separate said bent glass sheets from one another to provide a gap between said bent glass sheets sufficiently large to permit entry of said vacuum mold between said bent glass sheets,

a mold loading station adjacent said assembly station,

means to selectively apply vacuum to said vacuum mold,

a carriage,

means at said mold loading station for pivotally supporting said vacuum mold relative to said carriage for movement between a first orientation wherein said first wall has an upwardly facing convex elevational configuration for facilitating mounting said flexible sheet of interlayer material thereon and a second orientation wherein said first wall has a downwardly facing concave elevational configuration and said flexible sheet is supported thereagainst by vacuum,

means to move said carriage from said mold loading station to said assembly station when said vacuum mold is at said second orientation, said carriage moving means being constructed and arranged to deliver said vacuum mold into a position within said gap and said vertically extending space in vertical alignment over said lower bent glass sheet,

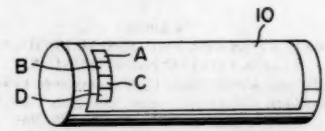
means to move said vacuum mold in a downward vertical direction relative to said vertically extending space in alignment with said lower bent glass sheet to engage said flexible sheet against said lower bent glass sheet to form a subassembly.

4,420,363

ONE-BATH ETCHING METHOD FOR PROCESSING GRAVURE PLATE, AND ETCHING CONDITION CALCULATING DEVICE

Eiichi Tachibana, Toda, and Tetsuro Katsuta, Tokyo, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1982, Ser. No. 444,517
Claims priority, application Japan, Dec. 4, 1981, 56-195354; Feb. 12, 1982, 57-20888
Int. Cl.³ B41C *1/00*
U.S. Cl. 156—627 5 Claims



1. A one-bath etching process in which, in forming gravure cells in the surface of a gravure cylinder by supplying an etching solution having a predetermined density, cell depths are controlled by varying the rotational speed of said cylinder; in which data on relations between inspecting solution permeation times of a resist layer on said cylinder and set cell depths are compared with reference data which include data on relationships between inspecting solution permeation times and

etching solution permeation times, with respect to the gradations of a testing gradation scale, of said resist layer and data on relationships between inspecting solution permeation times and cell depths with respect to the combinations of etching times and cylinder speeds, to obtain a total etching time and a cylinder speed before said etching solution is supplied, and thereafter said cylinder is etched according to said total etching time and cylinder speed thus obtained.

4,420,364

HIGH-INSULATION MULTI-LAYER DEVICE FORMED ON A METAL SUBSTRATE

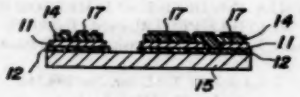
Takashi Nukii, Nara; Shigeo Nakabu, Nara; Masaru Iwasaki, Izumisano, and Katsunobu Awane, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 42,951, May 29, 1982, which is a continuation of Ser. No. 847,912, Nov. 2, 1977, abandoned. This application May 19, 1982, Ser. No. 379,722

Claims priority, application Japan, Nov. 2, 1976, 51-132121; Mar. 24, 1977, 52-33064

Int. Cl.³ B44C 1/22; C03C 15/00, 25/06; C23F 1/02

U.S. Cl. 156—631 3 Claims



1. A method for fabricating a multi-layer substrate comprising the steps of:

preparing a provisional supporting plate;

forming bottom thin-film conductors on said provisional supporting plate in a desired pattern;

attaching a high-insulation adhesive sheet to said provisional supporting plate so as to cover said bottom thin-film conductors;

half-curing said high-insulation adhesive sheet;

separating said high-insulation adhesive sheet from said provisional supporting plate in such a manner that said bottom thin-film conductors are mounted on said high-insulation adhesive sheet;

disposing said separated high-insulation adhesive sheet on a metal plate in such a manner that said bottom thin-film conductors face outward;

disposing high-insulation organic film on said high-insulation adhesive sheet in such a manner that said high-insulation organic film covers said bottom thin-film conductors;

curing said high-insulation adhesive sheet to tightly connect said high-insulation adhesive sheet to said metal plate and said high-insulation organic film; and

forming top conductors on said high-insulation organic film.

4,420,365

FORMATION OF PATTERNED FILM OVER SEMICONDUCTOR STRUCTURE

William I. Lehrer, Los Altos, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Mar. 14, 1983, Ser. No. 474,866

Int. Cl.³ B44C 1/22; C03C 15/00, 25/06

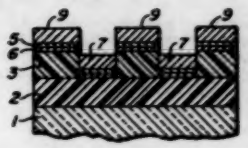
U.S. Cl. 156—643 10 Claims

1. A method of selectively removing portions of an etchable layer on a substrate according to a predetermined pattern, which method comprises:

(a) applying to said layer a first mask which is positive with respect to said pattern,

(b) adhesively binding to said masked layer an agent catalytic to the reception of electroless metal deposition,

(c) immersing said substrate in an electroless metal depositing bath and removing said first mask to form a second mask of electrolessly deposited metal, which second mask is negative with respect to said pattern, and



(d) forming by plasma etching openings in said layer in the unmasked areas thereof.

4,420,366

METHOD FOR MANUFACTURING SHADOW MASK

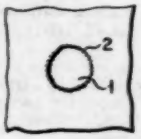
Koichiro Oka; Hiroshi Tanaka, and Makoto Harigae, all of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 24, 1983, Ser. No. 478,544

Claims priority, application Japan, Mar. 29, 1982, 57-48974

Int. Cl.³ C23F 1/02

U.S. Cl. 156—644 3 Claims



1. A method for manufacturing a shadow mask by spraying an Fe-Ni alloy sheet with a ferric chloride solution to form an aperture for passing an electron beam therethrough, wherein the ferric chloride solution is controlled to have a content of 0.30±0.20% by weight of free hydrochloric acid within a ferric chloride solution temperature range between 40° C. and 70° C., to have a total amount of Fe^{++} ions and Ni^{++} ions of not more than 15% by weight, and to have a specific gravity which falls within a region bounded between a curve plotted according to a relation $1.461-(4.63\times10^{-4}\times T)-(1.96\times10^{-6}\times T^2)$ (where T is a ferric chloride solution temperature) and a curve plotted according to a relation $1.552+(7.79\times10^{-5}\times T)-(1.18\times10^{-5}\times T^2)$.

4,420,367

METHOD FOR ETCHING A RECRYSTALLIZED ALUMINUM FOIL FOR ELECTROLYTIC CAPACITORS

Günter Löcher, Nattheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 15, 1982, Ser. No. 368,515

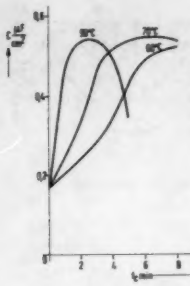
Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3118151

Int. Cl.³ B44C 1/22; C03C 15/00, 25/06; C23F 1/00

U.S. Cl. 156—651 10 Claims

1. Method for etching a recrystallized aluminum foil for electrolytic capacitors which comprises subjecting the recrystallized aluminum foil in a first etching stage to electrolytic tunnel formation to form a tunnel structure in the aluminum,

and subsequently subjecting the aluminum foil with the tunnel structure from the first etching stage in at least one further



non-electrolytic etching stage in a solution free of halogen ions to effect tunnel enlargement by chemical etching.

4,420,368

LATEX BINDERS FOR FIBROUS WEBS

John E. Drach, Montgomery County, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Jul. 24, 1981, Ser. No. 286,077

The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.

Int. Cl.³ D21H *3/38*

U.S. Cl. 162—8 **11 Claims**

1. A cellulosic fibrous non-woven web wherein the cellulose fibers are chemically modified by a cross-linking reaction with a binder comprising a copolymer latex of a monomer which is a polymerizable half-acid, half-amide corresponding to the following general formula:

$$NH_2-\underset{\underset{O}{\|}}{C}-R-\underset{\underset{O}{\|}}{C}-OR^1$$

wherein R is a hydrocarbon chain containing a multiple bond capable of radical polymerization and R^1 is H and at least one other ethylenically unsaturated monomer.

10. In a papermaking process, the step of re-pulping a cellulosic fibrous web wherein the cellulose fibers are chemically modified by a cross-linking reaction with a binder comprising a copolymer latex of a monomer which is a polymerizable half-acid, half-amide corresponding to the following general formula:

$$NH_2-\underset{\underset{O}{\|}}{C}-R-\underset{\underset{O}{\|}}{C}-OR^1$$

wherein R is a hydrocarbon chain containing a multiple bond capable of radical polymerization and R^1 is H and at least one other ethylenically unsaturated monomer.

4,420,369

PROCESS FOR THE DECOLORIZATION OF PULP MILL BLEACH PLANT EFFLUENT

David C. Eaton, Frederick, Md.; Thomas K. Kirk, Verona, Wis., and Hou-min Chang, Raleigh, N.C., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 25, 1982, Ser. No. 352,426

Int. Cl.³ D21C *11/00*

U.S. Cl. 162—29 **10 Claims**

1. A process for the decolorization of pulp mill bleach plant caustic extraction effluent comprising the steps wherein pulp and paper mill sludge containing aluminum, iron and calcium in acid-soluble form is acidified to an extent sufficient to dissolve from said sludge aluminum cations in an amount of at least about 0.004 grams per liter of said effluent to be decolorized, ferric cations in an amount of at least about 0.007 grams per liter of said effluent to be decolorized, and calcium cations in an amount of at least about 0.086 grams per liter of said effluent to be decolorized; said acidified sludge is mixed with said effluent; the resultant mixture of said acidified sludge and said effluent is raised to at least neutral pH, thereby forming a precipitate containing at least part of the colored material from said effluent; and said precipitate is separated from the accompanying liquor.

4,420,370

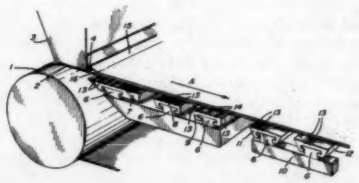
PULP AGITATING DEVICE AND METHOD HAVING MULTIPLE PROTRUDING INSERTS

Nabil R. Saad, Kanata, Canada, assignor to JWI Ltd., Ontario, Canada

Filed Jul. 19, 1982, Ser. No. 399,344

Int. Cl.³ D21F *1/54*

U.S. Cl. 162—209 **15 Claims**



1. A pulp agitating device comprising a support member having a single upper surface, a plurality of slots in said upper surface, each said slot having retention means for holding a respective one of a plurality of inserts in sliding engagement therein, said inserts being closely spaced and disposed in parallel relationship to one another and extending in a cross-machine direction and protruding above said upper surface to form cross-machine channels therebetween, said support member being supported in contact with a moving endless forming fabric of a paper-making machine to induce micro-pressure pulses to said moving forming fabric whereby fibers are agitated in pulp suspension on said fabric to obtain better distribution of said fibers.

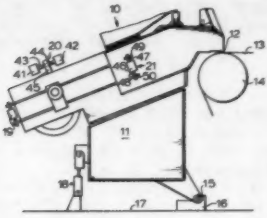
15. A method of agitating fibers in a pulp suspension in a moving endless forming fabric of a paper-making machine, said method comprising the steps of positioning a support element having a single upper surface having formed therein a plurality of slots provided with retention means for holding a respective one of a plurality of inserts in sliding engagement therein, positioning said inserts in said slots in closely spaced parallel relationship to one another and extending in a cross-machine direction and protruding above said upper surface to form cross-machine channels therebetween, displacing a surface of said forming fabric in contact with said inserts while supporting on an opposite surface said pulp suspension; inducing, by means of said channels, micro-pressure pulses to said moving forming fabric whereby fibers are agitated in said pulp suspension to obtain better distribution of said fibers.

4,420,371

ENERGY ABSORBERS FOR VIBRATING HEADBOXES

Carl B. Dahl, Rockton, Ill., and Jere W. Crouse, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed May 25, 1982, Ser. No. 381,899
Int. Cl.³ D21F 1/02
U.S. Cl. 162—272 **7 Claims**



1. In a headbox assembly wherein a headbox is subject to extraneous vibrational energy from adjoining machinery or the like, the improvement which comprises:

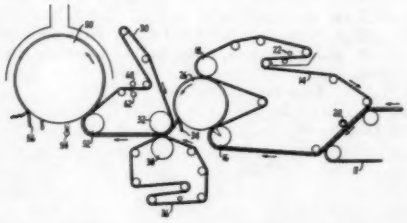
at least one vibration absorber rigidly secured to said headbox in the plane of vibration of said extraneous vibration, said vibration absorber creating a node at said headbox to absorb vibrational energy transmitted thereto.

4,420,372

HIGH BULK PAPERMAKING SYSTEM

Ronald E. Hostetler, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Division of Ser. No. 322,109, Nov. 16, 1981, Pat. No. 4,356,059.
This application Jul. 12, 1982, Ser. No. 396,994
Int. Cl.³ B31F 1/12
U.S. Cl. 162—280 **4 Claims**



1. Apparatus for manufacturing a bulky, soft and absorbent paper web comprising:

first rotatable dryer means having a smooth heated surface;

web delivery means defining a nip with said first dryer means and cooperable therewith to compact said web substantially overall and apply said web to said first dryer means surface;

web doctoring means for doctoring said web from said first dryer means surface;

a press means for receiving said web from said first drying means surface, said press means defined by a dewatering felt loop and an open mesh imprinting fabric loop formed of woven filaments having spaced compaction elements and defining voids between the filaments said compaction elements constitute at least about 5% of the total web supporting surface of said imprinting fabric; and

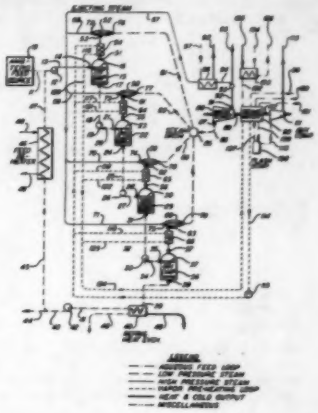
second rotatable dryer means having a smooth heated creping surface and web doctoring means for doctoring said web from said second dryer means surface, said imprinting fabric extending between said press and said creping surface of said second dryer means and defining a nip with the creping surface whereby said web is delivered from said press to said creping surface in essentially undisturbed condition and applied to said creping surface.

4,420,373

ENERGY CONVERSION METHOD AND SYSTEM

Dan Egosi, 7 Ben Gurion Blvd., Tel Aviv, Israel

Division of Ser. No. 910,098, May 30, 1978, Pat. No. 4,282,870.
This application Aug. 3, 1981, Ser. No. 289,843
Int. Cl.³ B01D 1/28; C02F 1/04; F22D 1/00
U.S. Cl. 202—173 **14 Claims**



1. A system for continuously generating usable heat energy, cooling capacity and pure water from an aqueous feed medium, the system including:

at least one evaporation chamber having an inlet for an aqueous feed medium at a predetermined initial temperature, an outlet for water vapor evaporated from the aqueous feed medium in the chamber, and an outlet for the cooled remainder of the aqueous feed medium as an eventual source of cooling capacity from the system;

mechanical compressor means having at least one inlet corresponding to said at least one evaporation chamber and coupled to the vapor outlet thereof for maintaining the chamber at a predetermined under-pressure below the boiling pressure of the aquoeus feed medium at said initial temperature and for withdrawing the evaporated water vapor from the chamber, the compressor further having an outlet for the vapor compressed therein to a usable output enthalpy as a first source of output heat energy from the system and an eventual source of pure water;

engine means energized by fuel consumption for driving the mechanical compressor means; and

means for utilizing the waste heat of the engine means to provide additional sources of output heat energy from the system, wherein said system comprises:

at least one steam ejector having an ejecting steam inlet, a vapor inlet connected to the vapor outlet of a corresponding eavporation chamber, and a combined ejecting steam-/evacuated vapor outlet connected to an inlet of the mechanical compressor means.

4,420,374

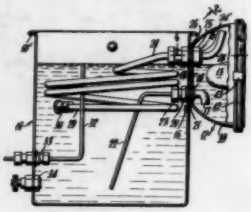
WATER DEGASIFICATION AND DISTILLATION APPARATUS

John C. Ellis, Jr., 1084 Palmer Ave., Larchmont, N.Y. 10538

Filed Jun. 3, 1981, Ser. No. 269,880
Int. Cl.³ B01D 3/02; C02F 1/04
U.S. Cl. 202—176 **3 Claims**

1. Water degasification and distillation apparatus comprising

a container for holding water to be degasified and distilled, a condenser having an inlet and outlet within said container, a boiler including heating means, individual conduits coupling said boiler to the inlet of said condenser and to said container, said boiler being positioned relative to said container so that the water level in the container will periodically be the same as the water level in the boiler and will partially fill the boiler, and said heating means will generate steam within said boiler at a rate greater than the capability of said condenser to handle the generated steam thus periodically forcing water from the boiler to the container and interrupting the boiling each time water is displaced from the boiler, said boiler being affixed to the outer side of said container, said individual conduits including a first conduit extending from said container into the lower portion of said boiler and a second conduit extending from the upper portion of said boiler into said container and coupled to the inlet side of said condenser, and said boiler is formed of two cooperating housing portions, a partition separating said housing portions and sealed to at least one of said housing portions and said heating means is carried by said partition and projects into said one housing portion and said first and second conduits communicating with said one housing portion with one of said conduits extending into said container for the circulation of water in said container to and from said boiler and the other of said conduits being connected to said condenser for condensing water vapor produced in said one housing portion by said heating means.

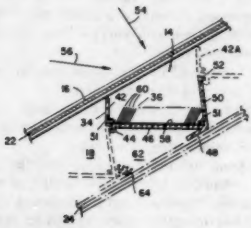


4,420,375

SOLAR STILL

Frank D. Husson, 10414 Woodchuck Point, San Diego, Calif. 92131

Filed Aug. 28, 1981, Ser. No. 297,228
Int. Cl.³ B01D *1/00*
U.S. Cl. 202—234 **7 Claims**



1. A solar still comprising:

spaced, parallel sidewalls including channel means along the upper edges thereof;

a plurality of interlocking, angled trays extending between said sidewalls at an angle whereby the bottoms of said trays are level when said still is placed at an angle for use;

a heat absorber element in the bottom of each said tray, said absorber element comprising a bottom plate resting on the bottom of said tray and a plurality of upstanding, spaced, parallel vanes, said absorber element being of a dark, heat-absorbing color;

an upper wall connecting said sidewalls at the upper end;

a lower wall connecting said sidewalls at the lower end;

transparent plate means slidably engaging said channel means and forming a cover for said still, said plate means butting against said lower wall; and

condensate collection means on the interior of said lower wall, whereby condensate coming off said cover plate onto said lower wall may flow by gravity out of said still.

4,420,376

SEPARATION OF RESORCINOL FROM NON-EXTRACTABLE IMPURITIES

Ward J. Burkholder, Gonzales, La., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 23, 1982, Ser. No. 410,346
Int. Cl.³ B01D *3/38, 3/40;* **C07C** *39/08*
U.S. Cl. 203—29 **7 Claims**

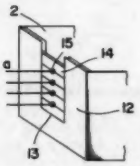
1. In a process for the manufacture of resorcinol from a rearranged oxidation product of m-diisopropylbenzene in an acetone solution, the improvement which comprises neutralizing said rearranged product to a pH, measured as 10% by weight solution in acetone of the rearranged oxidation product, in the range of from about 4.5 to about 6.3, filtering said neutralized solution to remove any salts therefrom, adding toluene to said filtered solution in an amount to provide a weight ratio of said filtered solution to toluene of from about 4:1 to about 1:2, distilling said acetone from the mixture of filtered solution and toluene at reflux temperature, steam distilling said acetone-free rearranged product/toluene mixture at a bottoms temperature in the range of from about 130° C. to about 300° C., separating the aqueous resorcinol-containing phase from the toluene phase, and thereafter recovering the resorcinol from said aqueous phase.

4,420,377

METHOD FOR CONTINUOUSLY ELECTROPLATING WIRE OR THE LIKE AND APPARATUS THEREFOR

Shoji Shiga; Akitoshi Suzuki; Yasuo Goma, and Kenji Kawada, all of Nikko, Japan, assignors to The Furukawa Electric Company, Ltd., Tokyo, Japan

Filed May 5, 1981, Ser. No. 260,779
Int. Cl.³ C25D *7/06, 17/06*
U.S. Cl. 204—28 **14 Claims**



1. A continuous electroplating method for wire, comprising the steps of providing at least one group of vertical, rotatable drums comprising two or more drums; connecting said drums to the cathode side of an electric power supply running a conductive wire between said drums spirally from the bottom toward the top in multiple stages; and passing said conductive wire repeatedly through an electrolyte of an electroplating electrolytic cell positioned between said drums; wherein back end of said electroplating electrolytic cell is provided with a vertically oriented slit to allow the passage of said conductive wire through the cell, each slit having a plurality of horizontally oriented weir plates that are placed one on top of the other within the slits at each end of the cell, said slits being substantially closed by said horizontally oriented weir plates; said weir plates having a vertical line of wire passage holes for

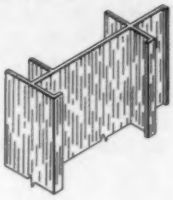
running said conductive wires in multiple stages through said cell, the holes being formed at joint surfaces between individual adjacent weir plates enclosing the wire circumference.

4,420,378

METHOD FOR FORMING DECORATIVE COLORED STREAK PATTERNS ON THE SURFACE OF AN ALUMINUM SHAPED ARTICLE

Masatake Tsuboi, Kurobe; Hatsuo Hirono, Nyuzen, and Kazuo Aikawa, Namerikawa, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Sep. 22, 1981, Ser. No. 304,671
Claims priority, application Japan, Sep. 30, 1980, 55-136181
Int. Cl.³ C25D *11/20*
U.S. Cl. 204—35 N **8 Claims**



1. A method for forming decorative colored streak patterns on the surface of a shaped article of aluminum or an aluminum-based alloy by erosion which comprises the successive steps of

(a) carrying out an anodic direct current electrolysis with the aluminum article having been previously provided with an anodically oxidized surface film as the anode in an electrolytic solution containing at least one kind of alkali metal ions or alkaline earth metal ions for a period of from 0.5 to 10 minutes,

(b) thereafter carrying out a cathodic direct current electrolysis with the aluminum article as the cathode in an electrolytic solution of substantially the same composition as used in the anodic direct current electrolysis of the step (a) for period of from 5 to 20 minutes to form eroded streak patterns engraved in the surface of the aluminum article,

(c) anodizing the surface of the aluminum article having been provided with the streak patterns in an electrolytic solution containing at least one inorganic or organic acid to form an anodically oxidized surface film thereon, and

(d) subjecting the aluminum article provided with the anodically oxidized surface film to a coloring treatment.

4,420,379

METHOD FOR THE FORMATION OF POLYCRYSTALLINE SILICON LAYERS, AND ITS APPLICATION IN THE MANUFACTURE OF A SELF-ALIGNED, NON PLANAR, MOS TRANSISTOR

Eugene Tonnel, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 16, 1980, Ser. No. 187,960
Claims priority, application France, Sep. 18, 1979, 79 23242
Int. Cl.³ C25D *11/32*
U.S. Cl. 204—38 A **6 Claims**

1. A method for the localized formation of polycrystalline silicon layers on silica covered zones of a silicon plate, comprising the following steps:

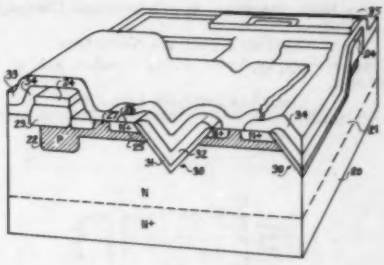
depositing a substantially uniform layer of polycrystalline silicon on a first face of the plate having zones covered with silica,

anodizing the plate by placing it in an acid bath that is an aqueous solution of 2 to 15% hydrofluoric acid and providing an electric current in this bath between a second face of the plate and an electrode placed in the bath to remove the polycrystalline silicon from zones of the first face of the plate not covered with silica.

3. A method for manufacturing a non planar MOS transistor structure from a silicon plate, comprising the following successive steps:

(a) forming slots in the plate and covering them with a layer of silicon oxide,

(b) depositing a substantially uniform layer of polycrystalline silicon on a first face of the plate including the slots and anodizing the plate by placing it in an acid bath and



circulating a current in this bath between a second face of the plate and an electrode placed in the bath to remove the polycrystalline silicon from those areas of the plate not having a silicon oxide layer,

(c) successively implanting, diffusing and masking using the polycrystalline silicon formed on the silica as a limit to the implantation mask on one side and on the other of the slots to obtain a classical non planar MOS transistor structure, and

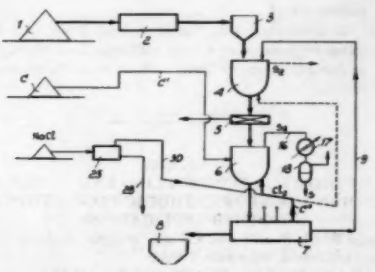
(d) applying metallizings and connections.

4,420,380

METHOD FOR EXTRACTING HEAVY METALS FROM SULPHURATED MINERAL CONCENTRATES

Umberto Ducati, Milan, Italy, assignor to Gianfranco Rambaldini, Concesio, Italy

Filed Mar. 9, 1981, Ser. No. 242,091
Int. Cl.³ C25C *3/00, 3/34*
U.S. Cl. 204—66 **9 Claims**



1. A method for extracting heavy metals from mineral concentrates containing said heavy metals at least partly in sulphurated and at least partly in oxidized form, characterized in that it comprises the steps of dissolving said concentrates in a bath of molten alkali metal chlorides, or of a mixture of prevailing amount of said alkali metal chlorides with a lower amount of chlorides of said heavy metals, chlorinating the concentrates by injecting chlorine gas into the bath to which carbon has been added in an amount sufficient to prevent formation of sulphur dioxide, whereby vapors of pure sulphur are evolved

as by-product, said chlorination being carried out at a temperature in the range of from 450° to 650° C, and subjecting then the bath to electrolysis to separate said heavy metals to the cathode and chlorie to the anode.

4,420,381

ELECTROLYTIC METHOD AND CELL FOR METAL PRODUCTION

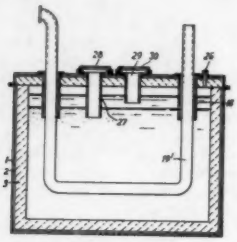
Olivo G. Silvilotti, Kingston, Canada, and Junkichi Iseki, Osaka, Japan, assignors to Alcan International Limited, Montreal, Calif.

Filed Feb. 8, 1982, Ser. No. 347,084

Claims priority, application United Kingdom, Feb. 26, 1981, 8106040

Int. Cl.³ C25C 3/00, 3/04, 7/06

U.S. Cl. 204—70 10 Claims



1. A method for the production of metal by electrolysis of a molten electrolyte, which is more dense than the metal, by passage of current between at least one vertically arranged anode and one vertically arranged cathode immersed in said electrolyte in an electrolysis chamber and conveying the product metal to a product collection chamber characterised in that

(a) the molten metal is collected in the product collection chamber as a supernatant layer to shield the electrolyte from atmospheric moisture,

(b) a thermally insulating cover is maintained over said molten metal to minimise heat loss from said molten metal,

(c) an atmosphere effective for reducing oxidation of such metal to non-significant levels, is maintained over said molten metal,

(d) the electrolyte temperature is held down to a desired value by passage of a heat exchange fluid through heat exchanger means in direct contact with the molten electrolyte.

4,420,382

METHOD FOR CONTROLLING END EFFECT ON ANODES USED FOR CATHODIC PROTECTION AND OTHER APPLICATIONS

George Riedl, Pierrefonds, Canada, assignor to Alcan International Limited, Montreal, Canada

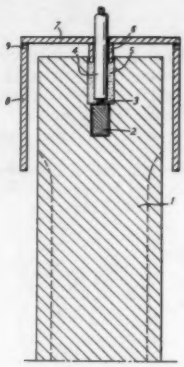
Filed Jan. 13, 1981, Ser. No. 224,803

Claims priority, application United Kingdom, Jan. 18, 1980, 8001783

Int. Cl.³ C23F 13/00

U.S. Cl. 204—147 10 Claims

1. A method of improving the performance of a generally cylindrical anode having an insulated conductor electrically connected at one end thereof and being located within a surrounding body of corrosive medium which comprises placing a shield formed of electrically non-conducting material in said medium and around a minor portion of the length of the cylindrical surface of the anode and around said insulated conductor at said one end of said anode, said shield being spaced away from said cylindrical surface by a substantial distance which is



small in relation to the radius of curvature of said cylindrical surface.

4,420,383

FRACTIONATING METHOD IN ELECTROPHORESES

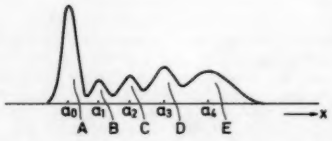
Toshihide Fujiwara, Hachiouji, and Shinichi Kamachi, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1981, Ser. No. 281,495

Claims priority, application Japan, Jul. 10, 1980, 55-94161; Jul. 10, 1980, 55-94162

Int. Cl.³ G01N 27/26

U.S. Cl. 204—180 G 5 Claims



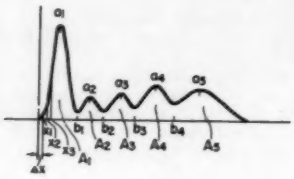
1. A fractionating method in electrophoresis comprising a first step wherein points on an abscissa corresponding to peak tops and minimum points on a densitogram obtained by electrophoresizing a reference human serum sample are determined in advance by scanning the densitogram obtained by electrophoresizing said reference serum sample and are memorized as reference positions, a second step wherein said reference positions are made to correspond so as to have the same basic position on an abscissa of a densitogram obtained by electrophoresizing a human serum sample to be examined, a third step wherein the points on the abscissa corresponding to minimum points on the densitogram obtained by electrophoresizing said human serum sample to be examined are automatically compared with said reference positions corresponding to them and only the points on the abscissa corresponding to the minimum points nearest to said reference positions are treated as boundary points; and a fourth step wherein said reference positions are treated as boundary points when the points on the abscissa corresponding to the minimum points nearest to said reference positions are not present in said third step.

4,420,384

METHOD FOR DETERMINING BOUNDARY POINTS ON ELECTROPHORETIC PATTERNS AND MEANS THEREFOR

Toshihide Fujiwara, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1981, Ser. No. 292,537
Claims priority, application Japan, Aug. 22, 1980, 55-115659
Int. Cl.³ G01N 27/26
U.S. Cl. 204—180 G 2 Claims



1. A method for determining boundary points on electrophoretic patterns, comprising a step wherein a densitogram is obtained from fractionated patterns formed by an electrophoresis, a step wherein the data obtained by sampling from said densitogram and the boundary point information determined on the basis of said data are memorized in a computer, and a step wherein the boundary point erasing or new boundary point setting information is put into said computer by a terminal device on the basis of an analogue pattern obtained from said fractionated patterns to alter the boundary point information memorized in said computer, a boundary point being put into said computer on the basis of an input distance information when the boundary point is to be added, and the boundary point being erased by putting the address number of the boundary point into said computer when the boundary point is to be erased.

4,420,385

APPARATUS AND PROCESS FOR SPUTTER DEPOSITION OF REACTED THIN FILMS

Larry D. Hartsough, Berkeley, Calif., assignor to Gryphon Products, Hayward, Calif.

Filed Apr. 15, 1983, Ser. No. 485,556
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 R 12 Claims

1. A method of forming a thin reacted film of selected thickness on a substrate, said method comprising the steps of:

(a) placing said substrate in the process chamber of a sputtering apparatus, said chamber having a sputtering zone and a separate reaction zone;

(b) providing an inert atmosphere in said sputtering zone and a chemically reactive atmosphere in said reaction zone;

(c) sputter depositing a layer of first material onto said substrate in said sputtering zone;

(d) subsequently moving said substrate from said sputtering zone to said reaction zone; (e) retaining said substrate in said reaction zone for a residence time sufficient to convert said layer of first material to a reacted layer of second material; (f) returning said substrate to said sputtering zone; and

(g) repeating steps (c) through (f) until a desired thickness of reacted film is formed on the substrate.

4,420,386

METHOD FOR PURE ION PLATING USING MAGNETIC FIELDS

Gerald W. White, Dallas, Tex., assignor to White Engineering Corporation, Dallas, Tex.

Filed Apr. 22, 1983, Ser. No. 487,748
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 N 14 Claims

1. A method for ion plating a substrate within a chamber with a plating material comprising the steps of:

evacuating said chamber;

vaporizing plating material in the evacuated chamber;

placing an electron saturated magnetic field adjacent the substrate for positive ionization of evaporant atoms of the vaporized plating material; and

applying a negative bias on the substrate for attracting positive ions of the vaporized plating material.

4,420,387

ELECTROLYSIS APPARATUS

Dieter Bergner; Kurt Hannesen, both of Kelkheim; Wilfried Schulte, Hofheim am Taunus, and Peter Steinmetz, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 10, 1980, Ser. No. 129,179
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1979, 2909640
Int. Cl.³ C25B 9/00, 11/06, 11/10, 13/08
U.S. Cl. 204—263 9 Claims

1. In electrolysis apparatus for the manufacture of chlorine from an aqueous alkali metal halide solution, including at least one electrolytic cell having an anode, a cathode and a separating wall interposed between said anode and cathode; a housing formed of two shells for containing said anode, cathode and separating wall; means provided in said housing for feeding electrolysis starting materials therein and/or discharging the products of electrolysis therefrom; said shells having rims which, when the apparatus is assembled, clamp said separating wall therebetween; sealing elements positioned between said separating wall and the respective rims; and at least one pair of electrically non-conductive elements mechanically coupled to respective ones of said shells and having said separating wall disposed therebetween for establishing a spacing between said anode and cathode and a separation between said separating wall and each of said anode and cathode; the improvement wherein said anode and cathode both extend to the rims of said shells and are in mechanical and electrically conductive contact with respective ones of said rims; and electrically conductive spacer elements fixed to said shells and being in mechanical and electrical contact with respective ones of said anode and cathode.

4,420,388

HYDROTREATING VACUUM GAS OILS WITH CATALYST AND ADDED ORGANIC FLUORINE COMPOUND

Ralph J. Bertolacini, Naperville; James F. Mosby, Palos Heights, and John G. Schwartz, Naperville, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 14, 1981, Ser. No. 301,754
Int. Cl.³ C10G 47/12
U.S. Cl. 208—112 7 Claims

1. The method of hydrotreating which comprises converting at least 20 percent by weight of a vacuum gas oil fraction boiling above 650° F. into products having a boiling point less than about 650° F. with a hydrodesulfurization catalyst comprising a Group VIB and Group VIII metal on a support consisting essentially of alumina wherein an organic fluorine compound is added to the vacuum gas oil during hydrotreating and the vacuum gas oil is hydrotreated under hydrogen at a temperature of at least 740° F.

4,420,389

DE-ASHING LUBRICATING OILS

Alden E. Beckworth; Jerald A. Howell, and Donald C. Tabler, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 14, 1982, Ser. No. 417,937
Int. Cl.³ C10G 17/00, 9/12, 9/16; C10M 11/00
U.S. Cl. 208—251 R 9 Claims

1. In a process for the production of an essentially ash-free oil stock from a lubricating oil containing ash-forming components wherein the process comprises:

(a) contacting said lubricating oil with an aqueous solution of a treating agent comprising a suitable ammonium salt under conditions sufficient to dispense said agent in said lubricating oil and to react said agent with ash-forming components of said lubricating oil;

(b) removing a major portion of the water from the mixture resulting from combining said aqueous solution and said lubricating oil;

(c) heating at least a portion of the product resulting from step (b) in the temperature range of about 300° to about 420° C. for a period of time sufficient to increase the amount of ash-forming components that can be removed from the oil;

(d) cooling the product from step (c) to a temperature in the range of about 100° to about 180° C.; and

(e) separating solids from the product of step (d);

the improvement comprising conducting step (c) by passing the oil from step (b) into a soaking vessel containing a large volume of said oil having a soaking temperature in the range of about 300° C. to about 420° C. before the oil from step (b) is heated to a temperature higher than 200° C. and passing portions of said large volume of oil through a heating coil wherein said oil is heated to a temperature in the range of 300° C. to 420° C. and recycled to said soaking vessel wherein the residence time for the oil in said soaking vessel is such that the fouling of the heating coil is less than it would be if the oil from step (b) were heated to the same temperature by being passed directly through the heating coil.

4,420,390

MAGNETIC SEPARATOR FOR PARTICULATES

Ronald Carr, 23743 Research Dr., Farmington, Mich. 48024

Filed Jan. 25, 1982, Ser. No. 342,154
Int. Cl.³ B03C 1/14
U.S. Cl. 209—216 13 Claims

1. A magnetic separator for particulates containing prime material and ferrous particles comprising a housing of predetermined length having end walls, side walls of the same length, a bottom wall and a removable cover of the same length having a central throated inlet along the length thereof;

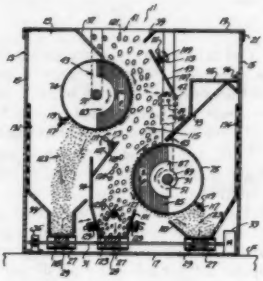
a pair of parallel, vertically and laterally displaced hollow metallic rolls, each having spaced ends, rotatively mounted and journaled upon said end walls and of a length extending substantially the length of said housing;

an elongated permanent magnet of semi-cylindrical form non-rotatively mounted within each roll, said magnets being of opposite polarity, with their convex surfaces being opposed and arranged along the inner side of each roll;

a pair of elongated, vertically and laterally displaced adjustable flow control dampers extending along the length of said housing, pivotally mounted and supported between said end walls and defining with said inlet and rolls a vertical first flow path;

an elongated first hopper underlying said first flow path extending the length of said housing and having a constricted underlying outlet;

a first conveyor within said housing along its length underlying said first hopper and having spaced ends projecting outwardly of said end walls for delivering prime material outwardly of said housing;



second and third hoppers within said housing along its length spaced from opposite sides of said first hopper underlying said rolls respectively, each hopper having spaced ends and a constricted underlying outlet;

the ferrous particles adhering to said rolls respectively and successively dropping into said second and third hoppers respectively;

and corresponding second and third conveyors within said housing along its length underlying said second and third hoppers respectively and projecting outwardly of said end walls for delivering ferrous particles outwardly of said housing;

said rolls being rotatable relative to said magnets, whereby the magnetic attractive force is continuously applied to ferrous particles within said particulates in said first flow path;

said ferrous particles adhering to said rolls until the corresponding roll surface has moved away from the magnets, releasing said ferrous particles to fall by gravity into the second and third hoppers respectively.

4,420,391

SCREEN TENSIONING ARRANGEMENT

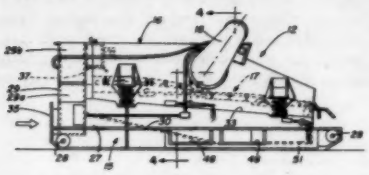
Martin J. Sharki, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 13, 1981, Ser. No. 310,007
Int. Cl.³ B07B 1/49
U.S. Cl. 209—403 4 Claims

1. In a vibrating screen of the type including a base, a screen box resiliently supported on the base and having a feed end and a discharge end longitudinally spaced from the feed end, screen means removably secured to said screen box and extending longitudinally, drive means including a rotating eccentric weight vibrator attached to said screen box for vibrating said screen means in a generally longitudinal direction, said

vibrating screen means been used for fine screening of solids from a slurry containing solids, the improvement which comprises:

said screen means including at least two overlying layers of relatively fine mesh screen cloth; and



tension means connected to the ends of said overlying layers of screen cloth for tensioning said overlying layers of screen cloth in a longitudinal direction parallel to the direction of motion of said screen whereby relative longitudinal motion between said overlying layers of screen cloth is substantially eliminated.

4,420,392

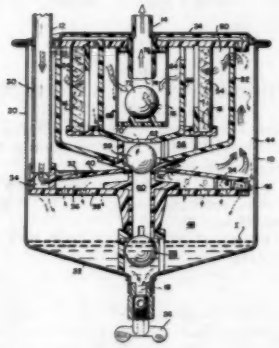
FUEL-WATER SEPARATOR WITH FLOW-REDUCTION FEATURE

Robert S. Harris, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Continuation-in-part of Ser. No. 241,076, Mar. 6, 1981, Pat. No. 4,384,962. This application Mar. 4, 1982, Ser. No. 354,813

Int. Cl.³ B01D *21/26*

U.S. Cl. 210—86 **10 Claims**



1. A fuel-water separator comprising

a container,

an inlet to and an outlet from the container, the inlet and outlet being connectable in a fuel line supplying an engine,

a pair of passages leading to the outlet, a first of which is much larger than the second,

means inside said container defining a progression of spaces through which the fuel moves from the inlet to the outlet, said space-defining means being disposed in said container to direct the fuel through a series of downwardly and upwardly directed paths as it moves through said spaces to cause the higher density water to move downwardly while the lower density fuel moves upwardly, said space-defining means further defining openings in the lower portions of said spaces through which the separated water drains downwardly, first valve means for closing at least one of said openings to control the fuel and water movement, and

second valve means actuable by a predetermined amount of water in the container for closing said larger passage whereby only restricted operation of said engine is permitted by virtue of the fuel flow rate through said smaller passage.

4,420,393

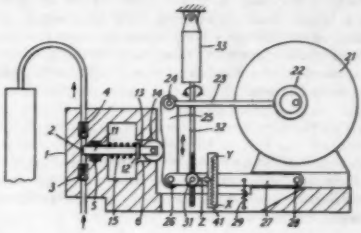
PUMP FOR LIQUID CHROMATOGRAPHY AND A CHROMATOGRAPH INCLUDING THE PUMP

Sydney W. Smith, Hitchin, England, assignor to Applied Chromatograph Systems Limited, Luton, England

Filed Nov. 6, 1981, Ser. No. 318,819

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—101 **7 Claims**



1. A liquid chromatograph comprising a pump having a single pump unit including a single chamber, a valve-controlled inlet, a valve-controlled outlet, a single reciprocatory element arranged for reciprocating movement within said chamber, and varying means for varying the length of stroke of said reciprocating element, said pump further comprising a constant-speed driving means for driving said pump unit via said varying means and for effecting reciprocating movement of said reciprocatory element at a constant frequency between 5 and 100 strokes per second and including a chromatography column having an inlet connected by a pipe, without any pulse damper, to the outlet of said pump, and monitoring means for monitoring said varying means to thereby provide information on the length of the stroke of said reciprocating element and thus the delivery of said pump.

4,420,394

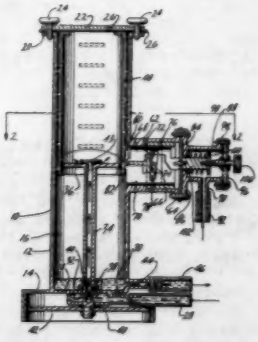
SOLID GRANULAR CHLORINE DISPENSER FOR SWIMMING POOLS

Kenneth Lewis, 11201 S. Garfield, South Gate, Calif. 90280

Continuation-in-part of Ser. No. 205,589, Nov. 10, 1980, abandoned. This application Nov. 6, 1981, Ser. No. 318,954

Int. Cl.³ E04H *3/20*

U.S. Cl. 210—169 **24 Claims**



1. Apparatus for dissolving highly soluble chlorine com-

pound granules into a pool or the like in which a pump periodically operates to circulate water from the pool through a filter and back to the pool, the apparatus comprising:

a housing, means defining the side walls of a vertical chamber within the housing for receiving the chlorine compound granules, means providing a bottom surface in the chamber for initially supporting the chlorine compound granules when they are poured into the chamber, means directing a flow of water over said bottom surface in the chamber for wetting and dissolving the lowermost granules in the chamber adjacent the bottom surface, the wetted granules immediately above the surface of the water expanding against the sides of the chamber and forming a bridge supporting the still dry granules in the upper portion of the chamber, and means for adjusting the vertical level of the bottom surface upwardly relative to the side walls of the chamber to raise the level of the water flowing across said surface in relation to said vertical chamber to bring the water into contact with the under surface of said bridge formed by the undissolved chlorine granules within the chamber, said means for adjusting the vertical level of the bottom surface in relation to said vertical chamber including means responsive to cycling the pump off and on for adjusting the position of the bottom surface relative to the vertical chamber by a predetermined incremental amount with each off-on cycle of the pump.

4,420,395

BLOOD PURIFICATION DEVICE

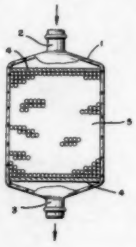
Masao Tanihara; Toshihide Nakashima, both of Kurashiki, and Koichi Takakura, Okayama, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jul. 7, 1982, Ser. No. 395,975

Claims priority, application Japan, Jul. 10, 1981, 56-108670

Int. Cl.³ B01D *39/06*

U.S. Cl. 210—263 **13 Claims**



1. A blood purification device which comprises an adsorbent layer of packed, substantially spherical, porous granules made of a material selected from the group consisting of porous glass, porous silica, and porous silica-alumina and having at least 0.1 μmole/m^2 of the silanol group on the surface thereof, a blood inlet and a blood outlet.

4,420,396

FILTER DEVICE FOR FUEL TANK

Kiyokazu Yamamoto, Fujisawa; Ko Hiratsuka, Chigasaki; Toshie Tanaka, Machida, and Shigeyuki Iwasaki, Machida, all of Japan, assignors to Nifco Inc. and Jidosha Denki Kogyo Kabushiki Kaisha, both of Yokohama, Japan

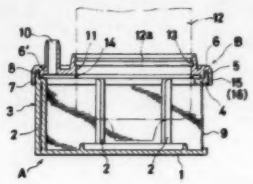
Filed May 4, 1982, Ser. No. 374,782

Claims priority, application Japan, May 8, 1981, 56-68205

Int. Cl.³ B01D *27/04, 35/02*

U.S. Cl. 210—416.4 **28 Claims**

1. In a filter device for a fuel tank, comprising an upper wall formed integrally with, or admitting therethrough, a tubular member so as to support in position said tubular member, a bottom wall spaced from said upper wall, and a cylindrical wall consisting of a plurality of circumferentially spaced columns serving to support in position a mesh encircling a space intervening between said upper wall and said bottom wall, said cylindrical wall and either said upper wall or said bottom wall being molded of a plastic material in one integral part, the remaining bottom wall or upper wall being molded of a plastic material in one separate part, and said separate part being fixed to the free end of said cylindrical wall of said one integral part, the improvement which comprises an inner fitting peripheral wall surface provided on either the free end of said cylindrical



wall of said one integral part or said separate part, an outer fitting peripheral wall surface provided on the alternative, a continuous protuberance formed in a circumferential direction on one of said two peripheral wall surfaces, a continuous recess formed in a circumferential direction on the other peripheral wall surface, the part containing said outer fitting peripheral wall surface being formed of a plastic material having a relatively small rate of dimensional change, and the part containing said inner fitting peripheral wall surface being formed of a plastic material having a relatively large rate of dimensional change.

4,420,397

METHOD OF TREATING WASTE LIQUORS CONTAINING PHENOL

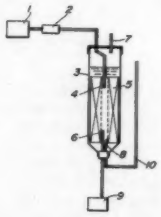
Yasuyuki Kaneko, Nagoya; Masao Itoh, Anjyo, and Shinji Takahashi, Chigasaki, all of Japan, assignors to Nagoya University, Nagoya, Japan

Filed Dec. 17, 1981, Ser. No. 331,808

Claims priority, application Japan, Dec. 19, 1980, 55-180020; Dec. 23, 1980, 55-182318

Int. Cl.³ C02F *3/34;* C12N *1/14;* C12R *1/645*

U.S. Cl. 210—611 **23 Claims**



1. A method of treating a waste liquor containing phenol, comprising:

pure-culturing a fungus of Aureobasidium sp. No. 14, FERM BP-1 on a support soaked with a preculture medium to produce mold-supports masses, said support being selected from the group consisting of fibrous materials and porous materials;

culturing the thus obtained mold-supports masses on said support in a waste liquor containing about 1,200 ppm or less of cyanide and about 3,000 ppm or less of phenol under aeration in a treating tank set with a filling skeleton

having a network structure at a temperature of about 20°–40° C. and a pH of about 3–9;

decomposing and assimilating phenol in the waste liquor in said treating tank by the oxidizing activity of said fungus under aeration;

culturing said fungus in the waste liquor in the treating tank under aeration so as to produce a large mold-hyphal-supports masses; and

removing the fungal cells from the treated waste liquor.

4,420,398

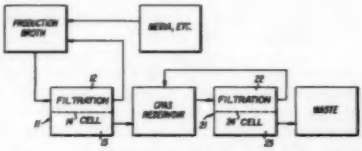
FILTERATION METHOD FOR CELL PRODUCED ANTIVIRAL SUBSTANCES

Franco Castino, Sudbury, Mass., assignor to American National Red Cross, Washington, D.C.

Filed Aug. 13, 1981, Ser. No. 292,582

Int. Cl.³ B01D *13/00, 31/00*

U.S. Cl. 210—641 **24 Claims**



1. A separation method for extracting Cell-Produced-Antiviral-Substances (CPAS) from a production broth containing the living cells which produce the CPAS consisting essentially of:

subjecting said broth and said living cells to a non-dead-end membrane filtration wherein the broth and said living cells are perfused into a first filtration cell and caused to flow across an ultra-filtration membrane in said cell which membrane has a nominal molecular weight cut-off of from twice to about five times the maximum molecular weight of the CPAS,

permitting a first filtrate to pass through said membrane consisting essentially of CPAS and some molecular species,

retaining in a first retentate all remaining portions of said broth, and wherein a diafiltration process is afforded by a partially-closed cycle continuous or semicontinuous flow, in which said first filtrate removed from the broth is replaced with an equal volume of media, thus maintaining a constant suspension volume throughout the process, and said first retentate is cycled back to the broth.

4,420,399

QUATERNARY AMINOMETHYL PHOSPHONATES AS SCALE INHIBITORS

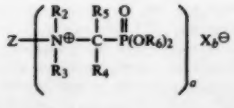
Derek Redmore, Webster Groves, MO, assignor to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 898,250, Apr. 20, 1978, abandoned, Continuation of Ser. No. 409,875, Oct. 26, 1973, abandoned. This application May 28, 1982, Ser. No. 382,870

Int. Cl.³ C02F *5/14*

U.S. Cl. 210—700 **12 Claims**

1. A process of inhibiting scale which comprises treating an aqueous system with scale inhibiting amounts of a quaternary aminophosphonate having the general formula



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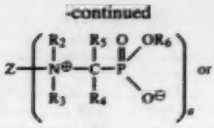
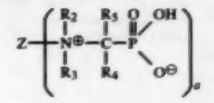


or



where Z is alkylene, alkyl, alkenyl, aryl or aralkyl, R_2 and R_3 are alkyl, alkenyl, aryl, or aralkyl, R_4 and R_5 are hydrogen or alkyl, R_6 is alkyl having 1 to 4 carbon atoms, a is 1 or 2 and b is 1 or 2, with the proviso that when Z is alkylene, a and b are 2 and when Z is alkyl, alkenyl, aryl or aralkyl a and b are 1, with the further proviso that Z and R_2 may be joined to form a cyclic group and X is an anion.

4,420,400

HYDROCARBON PRODUCTS DAMAGE CONTROL SYSTEMS

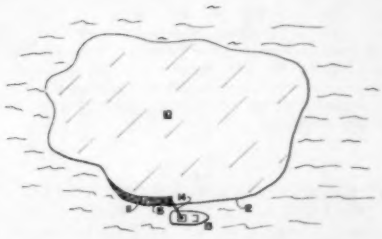
William Weitzen, Bethesda, Md., assignor to General Technology Applications, Inc., Reston, Va.

Continuation-in-part of Ser. No. 156,626, Jun. 5, 1980, abandoned. This application Jan. 22, 1982, Ser. No. 341,617

The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.³ C02C *1/22, 1/54*

U.S. Cl. 210—710 **23 Claims**



1. A method for bodying spilled liquid hydrocarbons which comprises dissolving sufficient polymer therein to form a non-flowing material of semi-solid to solid consistency by contacting said spilled hydrocarbons with a slurry of cryogenically comminuted polymer particles in a liquid cryogenic refrigerant.

15. A method for recovering spilled crude oil which comprises dissolving a polymer in said spilled oil by contacting said spilled oil with a slurry of cryogenically comminuted polymer particles in liquid nitrogen, said polymer displaying solubility in said crude oil and being heat decomposable, in an amount sufficient to convert said crude oil to a thickened, semi-solid to solid state, collecting said solidified oil and thereafter heating said solidified oil to a temperature whereat said polymer decomposes and said oil reverts to liquid form.

4,420,401
SOLUTION WASTE TREATMENT

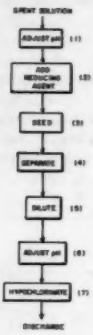
George A. Kretas, Everett, and Irving R. Ireland, Newton Lower Falls, both of Mass., assignors to Shipley Company Inc., Newton, Mass.

Division of Ser. No. 101,637, Oct. 14, 1979, which is a division of Ser. No. 40,954, May 21, 1979, Pat. No. 4,260,493. This application Jun. 22, 1981, Ser. No. 275,856

The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.

Int. Cl.³ C02F *1/52, 1/70*

U.S. Cl. 210—714 7 Claims



1. A process for removing dissolved metal from spent copper or nickel plating solutions containing a dissolved metal selected from the group of nickel and copper ions, and active complexing agent, said process comprising the steps of rendering said solution an electroless metal plating solution by adjusting the pH of the solution and adding a reducing agent to the solution in an amount sufficient to cause plate-out of the dissolved metal in solution and contacting the solution with a seeder for a time sufficient to plate substantially all of said metal from solution onto said seeder, said seeder comprising a particulate material of large surface area having a colloidal noble metal catalytic to deposition of the dissolved metal in solution absorbed on its surface, said particulate material with said absorbed colloidal noble metal having a thin layer of metal over at least 50 percent of its surface, said thin layer of metal being selected from the group of copper and nickel and being copper when said spent metal plating solution is a copper plating solution and being nickel when said spent plating solution is a nickel plating solution and separating said seeder from said plating solution.

4,420,402
METHOD AND APPARATUS WITH COUCH PRESS FOR DEWATERING A SLURRY OF FINE PARTICLES

Joseph A. Bolton, Queensbury, and Louis L. Dufresne, Glens Falls, both of N.Y., assignors to Albany International Corp., Menands, N.Y.

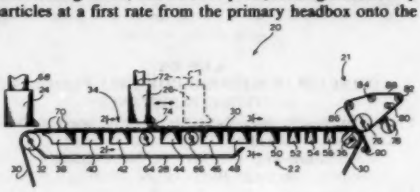
Filed Dec. 7, 1981, Ser. No. 328,084

Int. Cl.³ B01D *37/00*

U.S. Cl. 210—783 18 Claims

1. An apparatus for dewatering a slurry of particles comprising: forming fabric; means for driving said forming fabric with said means being sized; primary headbox being sized for feeding a first slurry of particles at a predetermined rate onto the forming fabric; secondary headbox being sized for feeding a second slurry of particles at a predetermined rate onto the first slurry of particles deposited on the forming fabric; suction means being sized and positioned so as to provide a vacuum on forming fabric passing thereby; said forming fabric being of sufficient porosity and said suction means providing sufficient vacuum so as to allow dewatering of the first and second slurry of particles on the forming fabric by the suction means; said means for driving said forming fabric drives at a rate sufficient to provide a mat of essentially only two discrete layers on the forming fabric; and a couch press receiving said mat for further dewatering thereof.

10. A method for dewatering a slurry of particles comprising: providing a primary headbox, secondary headbox, suction means, forming fabric of preselected porosity, means for driving the forming fabric, and a couch press; feeding a first slurry of particles at a first rate from the primary headbox onto the



forming fabric; feeding a second slurry of particles at a second rate from a secondary headbox onto the first slurry of particles; creating a sufficient vacuum on the first and second slurry of particles through the forming fabric by the suction means to cause dewatering of the first and second slurries thereon; driving said forming fabric at a fourth rate of speed by the driving means; said first, second, third and fourth rates of speed being sufficient so as to provide a mat of essentially only two discrete layers; and directing said mat to the couch press for further dewatering thereof.

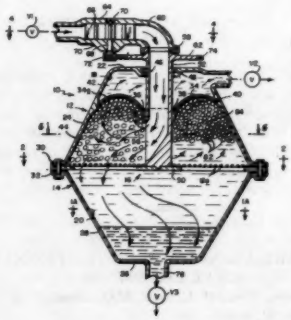
4,420,403
FILTER MODULE

Wesley M. Tufts, Holliston, Mass., assignor to Control Fluidics, Inc., West Bridgewater, Mass.

Filed Aug. 2, 1982, Ser. No. 404,635

Int. Cl.³ B01D *23/10, 33/18*

U.S. Cl. 210—787 28 Claims



25. A filter module comprising means defining a chamber having facing upper and lower frustoconical portions defining upper and lower chambers, a reticulated partition positioned diametrically of the chamber at the junction of the upper and lower chambers dividing the module symmetrically, a rotor, a bearing at the top of the module and a bearing at the center of the reticulated partition rotatably supporting the rotor, an annular reticulated partition positioned about the rotor between the top of the upper chamber and the bottom thereof, the partition dividing the upper chamber into a discharge chamber at the top and a filter chamber therebelow, a plurality of discrete bodies within said filter chamber, said partitions containing a plurality of circular holes and a plurality of elongate slots too small to prevent passage of the discrete bodies but large enough to permit filtrate to pass through and said

rotor defining an axial passage, one end of which is positioned at the top of the module externally thereof and the other end of which enters the chamber between the partitions, means at the top of the module for drawing off filtrate, means at the bottom of the module for drawing off solids, a drive member fixed to the rotor and means mounted to the module for drivably driving the drive member and, hence, effecting rotation of the rotor.

4,420,404

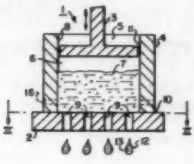
PROCESS FOR DEWATERING FINE GRANULAR MATERIALS

David W. Coate, and Joseph G. Selmeczi, both of Pittsburgh, Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 226,691, Jan. 21, 1981, abandoned. This application Dec. 14, 1981, Ser. No. 330,227

Int. Cl.³ B01D *33/00*

U.S. Cl. 210—808 **4 Claims**



1. A process for the dewatering of fine granular material and producing a coarse puck product comprising:

loading the fine granular material into an enclosed compression chamber having a drainage opening therein which is open and forms a non-tortuous path leading from the compression chamber, and wherein said granular material has a particle size one to five times smaller than the width of said drainage opening; and

applying a compressive force against the material thereby initially expressing fluid and material from the compression chamber via the non-tortuous path through the drainage opening until the intergranular friction of the particles of the material is increased so that material fluidization ceases allowing agglomeration of the material to occur and bridging of the drainage opening to take place thereby forming a coarse puck product.

4,420,405

WATER BASED DRILLING MUD ADDITIVE

Jack L. McCrary, Lafayette, La., assignor to Icarus, Inc., Lafayette, La.

Filed Aug. 10, 1981, Ser. No. 291,396

Int. Cl.³ C09K *7/02*

U.S. Cl. 252—8.5 A **18 Claims**

1. A process for producing a water based drilling mud additive which comprises:

(a) reacting with water in a first reaction zone at a temperature between 210°–280° F., a mixture having components comprising in percent by weight ratios:

Gilsonite	55–60%
Lignite	15–25%
Sodium Sulfite	15–25%
Water Soluble Base Compound	5–10%

for a period of time between 0.5–3.0 hours;

(b) reacting with water in a second reaction zone at a temperature between 210°–280° F., a mixture having components comprising in percent by weight ratios:

Tannin	25–40%
Lignite	35–45%
Sodium Sulfite	15–20%
Paraformaldehyde	1–5%
Water Soluble Base Compound	5–15%

for a period of time between 0.5–3.0 hours;

(c) removing by drying from said reaction zones substantially all of the water remaining after reacting to produce a first dried reaction product and a second dried reaction product; and

(d) blending equal portions by weight of said first and second reaction products.

4. A process for producing a water based drilling mud additive which comprises:

(a) reacting with water at a temperature between 210°–280° F. for a period of time between 0.5–3.0 hours, a mixture having components which comprise in percent by weight ratios:

Gilsonite	25–30%
Lignite	25–35%
Tannin	10–20%
Sodium Sulfite	15–25%
Paraformaldehyde	1–5%
Water Soluble Base Compound	5–15%

and;

(b) removing by drying substantially all of the water remaining after termination of the reacting to produce a dried product.

4,420,406

THICKENED HEAVY BRINES

Roy F. House, Houston, and Lonnie D. Hoover, Chappell Hill, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Jun. 20, 1980, Ser. No. 161,444

Int. Cl.³ E21B *43/00*

U.S. Cl. 252—8.55 R **13 Claims**

1. A thickened brine solution having a density in the range of from about 14.2 ppg to about 15.6 ppg and consisting essentially of water, at least 20% by weight zinc bromide, calcium bromide, and a viscosifying amount of hydroxyethyl cellulose.

4,420,407

METHOD OF LUBRICATING UPPER CYLINDER OF MARINE DIESEL ENGINE

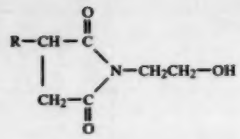
Rodney L. Sung, Fishkill; Benjamin H. Zoleski, Beacon; William P. Cullen, Fishkill, and Mahmoud S. Kablaoui, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 22, 1981, Ser. No. 313,564

Int. Cl.³ C10M *1/40*

U.S. Cl. 252—33.4 **3 Claims**

1. A method for lubricating the upper cylinder zone of a slow speed marine diesel engine wherein the fuel employed is a high sulfur residual fuel oil which continuously generates acidity which comprises injecting into the upper cylinder zone of said engine a lubricating oil composition having a Total Base Number in the range from about 50–100 comprising a mineral lubricating oil, from about 10–20 wt % of an overbased calcium sulfonate having a Total Base Number from about 300–450, and a friction modifying amount of an N-hydroxyethyl alkenylsuccinimide represented by the following formula:



in which R is a straight chain hydrocarbon radical having from about 12 to 18 carbon atoms.

4,420,408

MAGNETIC RECORDING MEDIUM

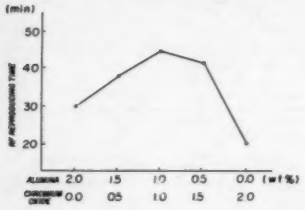
Norifumi Kajimoto, and Kinji Sasaki, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 20, 1981, Ser. No. 265,676

Claims priority, application Japan, Jun. 13, 1980, 55-78925

Int. Cl.³ H01F *1/00*; G11B *5/70*

U.S. Cl. 256—62.54 **5 Claims**



1. A magnetic recording medium which comprises an admixture consisting of at least two fine abrasive powders having different true specific gravities differing by more than 1.0, each of said powders being of a Moh's hardness of at least 7, in a magnetic layer containing a magnetic powder, the ratio of the two fine abrasive powders being in the range of 2:8 to 8:2.

4,420,409

HYDRAULIC SYSTEM AND HYDRAULIC FLUID COMPOSITIONS COMPRISING SILOXANE-OXYALKYLENE COPOLYMERS

Yoshimasa Fukano, and Minoru Yoshizawa, both of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 329,840

Int. Cl.³ C10M *3/44*

U.S. Cl. 252—78.3 **10 Claims**

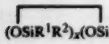
1. A hydraulic fluid composition consisting essentially of 1 to 99 percent by weight, based on the weight of the hydraulic fluid composition, of at least one siloxane-oxyalkylene copolymer and 1 to 99 percent by weight, based on the weight of the hydraulic fluid composition, of an oxyalkylene polymer oil which is compatible with the siloxane-oxyalkylene copolymer, said siloxane-oxyalkylene copolymer being selected from the group consisting of

$$R^1R^2R^3Si(OSiR^1R^2)_x(OSiR^1G)_yOSiR^1R^2R^3, \quad (I)$$

$$GR^1R^2Si(OSiR^1R^2)_x(OSiR^1G)_zOSiR^1R^2G, \quad (II)$$

$$R^1R^2R^3Si(OSiR^1R^2)_x(OSiR^1G)_zOSiR^1R^2G, \quad (III)$$

(IV)



$$R_aSi\{(OSiR^1R^2)_x(OSiR^1G)_yOSiR^1R^2R^3\}_{4-a} \text{ and} \quad (V)$$

$$R_aSi\{(OSiR^1R^2)_x(OSiR^1G)_zOSiR^1R^2G\}_{4-a} \quad (VI)$$

wherein each R^1 and R^2 denotes, independently, an alkyl radical, a halogen-substituted alkyl radical or a phenyl radical; each R^3 denotes, independently, an alkyl radical, a halogen-substituted alkyl radical, a phenyl radical, a hydroxyl radicals or an alkoxy radical; each G denotes, independently, a radical having the formula $-D(OC_nH_{2n})_mR^4$ wherein D denotes a divalent hydrocarbon radical and R^4 denotes a hydroxyl radical or a monovalent organic radical; and each subscript denotes a number such that a=0 or 1, n=2 to 10 inclusive, m=1 to 500 inclusive, x=0 to 500 inclusive, y=1 to 500 inclusive and z=0 to 500 inclusive.

4,420,410

PERSONAL CARE CLEANSING AGENT

Rudolf Hüttinger, Essen, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Sep. 3, 1981, Ser. No. 299,184

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3033929

Int. Cl.³ C11D *1/90, 7/26*; A61K *7/06*

U.S. Cl. 252—117 **3 Claims**

1. An aqueous solution of a mixture of:

(a) betaines having the formula

$$R^1N^{\oplus}R^2R^3(CH_2)_xCOO^{\ominus}$$

in which

R^1 is an alkyl radical of a fatty acid with 6 to 18 carbon atoms or the $R^4CONH(CH_2)_x$ radical, in which R^4 is an alkyl radical of a fatty acid with 6 to 18 carbon atoms, and

x=2 or 3,

R^2 and R^3 are the same or different and represent alkyl radicals with 1 to 4 carbon atoms and

y=1, 2, or 3;

(b) one or more anionic compounds selected from the group consisting of sodium or ammonium alkyl ether sulfate, alkanolamine alkyl ether sulfate, and alkanolamine alkyl sulfate, wherein the alkyl group has 8 to 14 carbon atoms; and

the weight ratio of a:b being about from 3:7 to 7:3,

(c) monoglycerides of fatty acids, the fatty acid component having from 8 to 18 carbon atoms and the minimum content of monoester being about 70 weight percent,

the amount of monoglycerides being from about 2 to 35 weight percent based on the amount of betaine.

4,420,411

PROCESS FOR AUGMENTING OR ENHANCING THE AROMA OF DETERGENTS USING UNSATURATED BRANCH CHAIN KETONES

Richard M. Boden, Monmouth Beach, and Theodore J. Tyszkiewicz, Sayreville, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jun. 4, 1982, Ser. No. 384,961

Int. Cl.³ C11D *3/50*

U.S. Cl. 252—174.11 **1 Claim**

1. A process for augmenting or enhancing the aroma of a solid or liquid anionic, cationic, nonionic or zwitterionic detergent comprising the step of adding to a solid or liquid anionic, cationic, nonionic or zwitterionic detergent base, an aroma augmenting or enhancing quantity of at least one product prepared by the process of (a) trimerizing isobutylene to form triisobutylene, a mixture of substances defined according to the structures:

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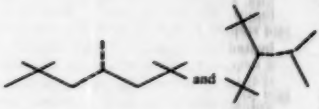
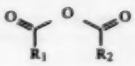
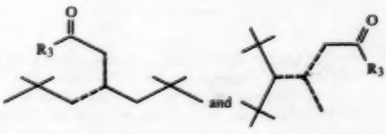


wherein in each of the molecules one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond and (b) reacting the resulting triisobutylene composition of matter with an alkanoic acid anhydride having the structure:



wherein R_1 and R_2 are the same or different and are each selected from the group consisting of methyl and ethyl, in the presence of a Lewis acid catalyst thereby producing a mixture of compounds comprising the compounds defined according to the structures:



wherein R_3 represents methyl or ethyl and in each of the molecules one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represents a carbon-carbon single bond.

4,420,412

ACTIVATION OF HYPOCHLORITE BLEACHING OF DYES

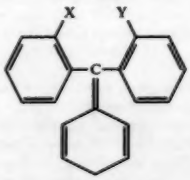
Louis F. Wong, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 204,120, Nov. 5, 1980, Pat. No. 4,353,866. This application Dec. 23, 1981, Ser. No. 333,953

Int. Cl.³ C11D *3/395*

U.S. Cl. 252—186.38 **6 Claims**

1. A method of bleaching water-soluble, ortho-substituted triarylmethane dyes which have in their structure the moiety



wherein X is selected from the group consisting of substituent groups other than hydrogen or methyl and Y is selected from the group consisting of X, hydrogen and methyl, said method comprising the step of forming a solution comprising from about 0.02 to about 2 ppm of said dye, from about 2 to about 30 ppm of available chlorine from hypochlorite ion, at least about 0.1 ppm bromide ion and at least about 0.1 ppm ammonium ion, the available chlorine to dye ratio in said solution being from about 2:1 to about 150:1, and the pH of said solution being from about 6 to about 9.5.

4,420,413

OXYALKYLATED ADDITION PRODUCTS FROM ETHYLENE OXIDE-PROPYLENE OXIDE BLOCK POLYMERS AND BIS-GLYCIDYL ETHERS AND THEIR USE

Helmut Diery, Kelkheim, and Martin Hille, Liederbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

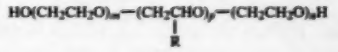
Filed Dec. 21, 1981, Ser. No. 332,968

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049450

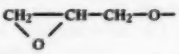
Int. Cl.³ B01D *17/04*; C08L *63/00*

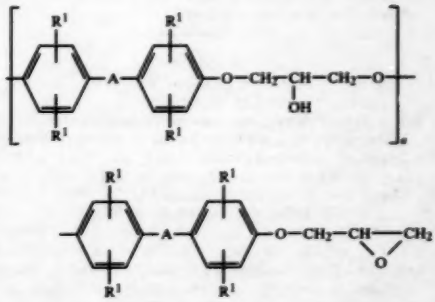
U.S. Cl. 252—331 **3 Claims**

1. An oxyalkylated addition product, said addition product being formed from the components consisting essentially of an ethylene oxide-propylene oxide block polymer and a bis-glycidyl ether, said addition product being obtained by the addition of an ethylene oxide-propylene oxide block polymer of the formula



in which R denotes methyl or ethyl, n and m are numbers which are so chosen that the content of polyethylene oxide groups constitutes 5 to 80% of the molecular weight of the block polymer and p is a number larger than 10, to a bis-glycidyl ether of the formula





in which the R^1's can be identical or different and denote hydrogen, C_1–C_4-alkyl or halogen, in particular chlorine, A denotes a direct bond, a sulfonyl or cyclohexyl group or a group of the formula

R^2 denotes hydrogen, methyl or phenyl and a is an integer from 0 to 10, said addition product being subsequently oxyalkylated with propylene oxide or butylene oxide and 0–50% ethylene oxide, the amount of the propylene oxide or butylene oxide which is added last being 1 to 90% by weight of the total molecule, the amount of the ethylene oxide, which may have

also been added, being up to 50% by weight of the total molecule.

4,420,414

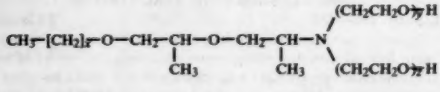
CORROSION INHIBITION SYSTEM

Frederick W. Valone, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Apr. 11, 1983, Ser. No. 484,049
Int. Cl.³ C23F *11/00*
U.S. Cl. 252—392 **28 Claims**

23. An oil-dispersible corrosion inhibiting solution comprising:

about 1% to about 10% by weight of an ethoxylated tertiary amine, represented by the formula



wherein x is about 9 to about 11 and the sum of (y+z) is about 2 to about 50;

about 65% to about 75% by weight of about a one to one mixture of a low molecular weight alcohol and water and

about 25% to about 35% by weight of an organic inhibitor formed by the reaction of about a one to one mixture of an amide and an alkyl amidoamine with about 100% to about 120% of the stoichiometric amount of a mixture of organic acids needed to neutralize the amide and amidoamine mixture at a temperature of about 75° to about 95° C. for about one to about two hours,

said amide formed by the reaction of an ethoxylated diamine with a fatty acid having about 15 to 20 carbon atoms per carboxylic acid group;

said mixture of organic acids being approximately a three to two to one mixture of a fatty acid having about 15 to 20 carbon atoms per carboxylic acid group, an oxyacid, and a dimer-trimer acid having about 15 to 20 carbon atoms per carboxylic acid group, respectively.

4,420,415

PROCESS FOR THE PRODUCTION OF CARBON MOLECULAR SIEVES

Nakaji Yuki, Kukizaki, and Hiroshi Kitagawa, Ibaragi, both of Japan, assignors to Director-General of Agency of Industrial Science & Technology, Tokyo, Japan

Filed Aug. 21, 1981, Ser. No. 294,930
Claims priority, application Japan, Aug. 27, 1980, 55-117930
Int. Cl.³ B01J *20/20*; C01B *31/08*; B01D *53/02*
U.S. Cl. 502—180 **5 Claims**

1. In a process for the production of carbon molecular sieves, including the steps of subjecting a vinylidene chloride copolymer to carbonization conditions for the removal of its chlorine component as hydrogen chloride, pulverizing the resulting product to a grain size of 100 mesh or finer, admixing the pulverized product with a carbonaceous sintering agent and an organic binder to obtain a mixture, pelletizing the mixture, and carbonizing the resulting pellets, the improvement comprising:

said admixing step, wherein said sintering agent includes a carbonaceous material derived from petroleum or coal and capable of forming a high-strength coke upon carbonization, is used in an amount of 10 to 14% based on the weight of said pulverized product and is a member selected from the group consisting of coal tar pitch, petroleum pitch and coking coal, and said organic binder is used in an amount of from 10 to 15% based on the weight of said pulverized product and includes a tenacious organic substance capable of being partially gasified when heated, with the remaining ungasified components being carbonized, and is selected from microcrystalline cellulose, a liquid resin, waste molasses and a sulfite pulp waste liquor, and

said step of carbonizing said pellets, wherein said pellets are heated to a temperature in the range of 750° to 1000° C. at a heating rate of 5° to 7° C./min and then maintained at that temperature for 30 to 90 min;

said molecular sieve having at least 80% of its total pore volume in pores with diameters of 4 to 4.3 Å.

4. The process according to claim **1**, wherein said sintering agent has a grain size of 100 mesh or finer.

5. The process according to claim **1**, wherein the heating of said pellets up to 300° C. is carried out at any optional heating rate and the heating of said pellets above 300° C. is carried out at a heating rate of 5° to 7° C./min.

4,420,416

UNSATURATED POLYESTERS PREPARED FROM A DICARBOXYLIC ACID AND DIBROMONEOPENTYL GLYCOL

Eric R. Larsen, and Ernest L. Ecker, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 189,236, Sep. 22, 1980, Pat. No. 4,384,109, which is a continuation-in-part of Ser. No. 99,259, Dec. 3, 1979, abandoned. This application Jul. 19, 1982, Ser. No. 399,631
Int. Cl.³ B01J *31/02*; C08G *63/20*
U.S. Cl. 502—168 **6 Claims**

1. A composition useful for making polyesters when reacted with a polycarboxylic acid, said composition comprising a solid solution of catalytic amounts of up to about 1 weight percent of an aryl sulfonic acid in dibromoneopentyl glycol.

4,420,417

ETHYLENE POLYMERIZATION CATALYST AND A PROCESS FOR ITS PREPARATION

Genevieve Le Brasseur, Bully les Mines, France, assignor to Societe Chimique des Charbonnages-CdF Chimie, Paris, France

Filed Jul. 29, 1982, Ser. No. 403,067
Claims priority, application France, Jul. 30, 1981, 81 14813
Int. Cl.³ C08F *4/64*
U.S. Cl. 502—169 **8 Claims**

1. A catalyst for polymerization of ethylene having the general formula:

$$M_nMg(OR)_{2+4n-m}X_m$$

wherein X is at least one halogen, M is at least one transition metal selected from the group consisting of the metals of groups IVa to VIa of the Periodic Table, R is an alkyl radical containing from 1 to 4 carbon atoms, $0.05 \leqq n \leqq 0.6$ and $0 < m < n+1$.

4,420,418

PARA-SELECTIVE ZEOLITE CATALYSTS

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 19, 1981, Ser. No. 322,629
Int. Cl.³ B01J *37/10, 29/28, 27/18*
U.S. Cl. 502—77 **10 Claims**

2. A method for treating a chemically modified zeolite catalyst in order to enhance the para-selectivity of said catalyst without significantly diminishing the activity thereof when said catalyst is utilized to promote alkylation of aromatic compounds, said catalyst comprising both a crystalline zeolite material having a constraint index within the approximate range of 1 to 12 and a silica/alumina mole ratio of at least 12 and a minor proportion of one or more difficulty reducible oxides, said method comprising

(a) improving the para-selectivity of said catalyst while at the same time lowering the activity of said catalyst by contacting said catalyst with a carboxylic acid selected from acetic acid, propanoic acid, butanoic acid, pentanoic

acid, 2-methylpropanoic acid, 2,2-dimethylpropanoic acid, 2-methylbutanoic acid, 3-methylbutanoic acid and anhydrides of said carboxylic acids at a temperature between about 0° C. and 100° C.; and thereafter

(b) improving the activity of the catalyst of step (a) without significantly diminishing the para-selectivity of the catalyst of step (a) by contacting said catalyst of step (a) with water vapor at a temperature between about 40° C. and 700° C. for at least about 1 hour.

3. A method according to claim 2 wherein said difficultly reducible oxide is selected from magnesium oxide, calcium oxide, phosphorus oxide, combinations of magnesium oxide and phosphorus oxide and combinations of calcium oxide and phosphorus oxide.

4. A method according to claim 3 wherein said carboxylic acid is acetic acid.

8. A process for treating a chemically modified zeolite catalyst in order to enhance the para-selectivity of said catalyst without significantly diminishing the activity thereof when said catalyst is utilized to promote alkylation of aromatic compounds, said catalyst comprising both a crystalline zeolite material selected from ZSM-5, ZS-11, ZMS-12, ZMS-23, ZMS-35, ZMS-38 and ZMS-48 and a minor proportion of one or more difficulty reducible oxides selected from magnesium oxide, calcium oxide, phosphorus oxide, combinations of magnesium oxide and phosphorus oxide and combinations of calcium oxide and phosphorus oxide, said method comprising

(a) improving the para-selectivity of said catalyst while at the same time lowering the activity of said catalyst by contacting said catalyst with acetic acid or acetic anhydride at a temperature between about 0° C. and 100° C.; and thereafter

(b) improving the activity of the catalyst of step (a) without significantly diminishing the para-selectivity of the catalyst of step (a) by contacting said catalyst of step (a) with water vapor at a temperature between about 40° C. and 700° C. for at least about 1 hour.

4,420,419

ABRASION-RESISTANT GRANULAR ZEOLITE AND PROCESS FOR PREPARATION THEREOF

Masahide Ogawa; Tetsuo Masuko, both of Shibata; Kunio Goto; Hideo Sugai, both of Nakajo, and Masao Takahashi, Shiunji, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 8, 1982, Ser. No. 355,380

Claims priority, application Japan, Mar. 10, 1981, 56-33138

Int. Cl.³ B01J *29/08, 29/18, 35/08*

U.S. Cl. 502—68 8 Claims

1. An abrasion-resistant granular zeolite formed from a mixture of a synthetic crystalline zeolite and a clay binder, said granular zeolite comprising a core composed of a synthetic zeolite-clay binder mixture containing the synthetic zeolite at a content higher than the average synthetic zeolite content in the total granular zeolite and a shell composed of a synthetic zeolite-clay binder mixture containing the clay binder at a content higher than the average clay binder content in the total granular zeolite, wherein the core and shell are present at a core/shell weight ratio of from 99/1 to 80/20, the core contains the synthetic zeolite and clay binder at a zeolite/binder weight ratio of from 90/10 to 60/40, the shell contains the clay binder and synthetic zeolite at a binder/zeolite weight ratio of from 95/5 to 30/70, the shell contains the clay binder at a content higher by at least 10 by weight than the binder content in the core, and said core and shell being calcined to harden the clay binder.

6. A process for the preparation of an abrasion-resistant granular zeolite, which comprises the steps of granulating a primary mixture containing a synthetic zeolite and a clay binder at a zeolite/binder weight ratio of from 90/10 to 60/40 by using an aqueous solution of a water-soluble polymeric binder as a granulating medium, thereby to form wet core particles, dry-blending the resulting wet core particles with a secondary powdery mixture containing the synthetic zeolite and the clay binder at a binder/zeolite weight ratio of from 95/5 to 30/70 to form a shell coating of said powdery mixtule on the surface of the core particles, said secondary mixture containing the clay binder at a content higher by at least 10% by weight than the clay binder content in the primary mixture and drying and calcining the resulting coated particles.

4,420,420

RHODIUM CATALYST AND METHOD FOR PREPARING THE SAME

Yukimitsu Mita, Oita; Ken-ichi Sano, Kawasaki; Shinya Matsuhira, and Tetsuo Nakajo, both of Oita, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 254,074, Apr. 14, 1981, Pat. No. 4,376,724.

This application Jul. 14, 1982, Ser. No. 398,181

Claims priority, applications Japan, Apr. 14, 1980, 55-48131; Apr. 14, 1980, 55-48132

Int. Cl.³ B01J *21/06, 23/46*

U.S. Cl. 502—261 4 Claims

1. A rhodium catalyst comprising active rhodium metal supported on a silica type or titania type support, said active rhodium being in the surface layer or near the surface layer of the particles of the support.

3. A rhodium catalyst comprising active rhodium metal supported on a silica type or titania type support, said active rhodium being in the surface layer or near the surface layer of the particles of the support and said catalyst being prepared by:

(i) adding sodium hydroxide or potassium hydroxide to an aqueous solution of a water-soluble rhodium salt to adjust the pH of the aqueous solution to at least 10, whereby said water-soluble rhodium salt is converted to rhodium hydroxide;

(ii) dipping a silica type or titania type support into said aqueous solution of rhodium hydroxide; and

(iii) drying and reducing the support impregnated with rhodium hydroxide, whereby the impregnated rhodium hydroxide is reduced to rhodium metal.

4,420,421

PROCESS FOR THE PREPARATION OF CATALYSTS BASED ON IRON AND MOLYBDENUM OXIDES

Roberto Canavesi, Arese; Giancarlo Aglietti, Milan, and Roberto Ghezzi, Cusano Milanino, all of Italy, assignors to Euteco Impianti S.p.A., Milan, Italy

Filed Dec. 2, 1981, Ser. No. 326,623

Claims priority, application Italy, Dec. 2, 1980, 26348 A/80

Int. Cl.³ B01J *23/88*

U.S. Cl. 502—316 6 Claims

1. Process for the preparation based on iron and molybdenum oxides, which are active in the oxidation of methanol to formaldehyde, characterised in that an aqueous solution of a soluble ferric salt is brought into contact with an aqueous solution of sodium molybdate having a pH value within the range 5.2 to 5.5 and a molybdenum content of about 32 to 33 g/liter; the molar ratio of the Molybdenum, as MoO_3, to iron, as Fe_2O_3, being greater than 2:1; the precipitate obtained is then washed with de-ionized water until the sodium content of the precipitate is equal or less than 150 ppm, the washed precipitate is then treated by known methods to obtain the final active catalyst.

4,420,422

METHOD FOR MAKING HIGH SURFACE AREA BISMUTH-CONTAINING PYROCHLORES

August Ferretti, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Nov. 1, 1982, Ser. No. 438,717

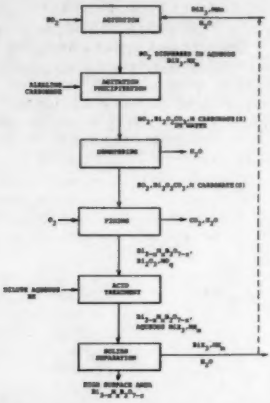
Int. Cl.³ H01B *1/06*

U.S. Cl. 252—518 6 Claims

1. A process for making a pyrochlore corresponding to the formula $Bi_{2-x}M_xB_2O_{7-z}$ wherein M is selected from the group consisting of cadmium, copper, lead, indium, gadolin-

ium, silver and mixtures thereof, B is selected from the group consisting of ruthenium, iridium and mixtures thereof, x is from 0 to 0.5, and z is from 0 to 1, comprising the sequential steps of:

(a) firing an intimate admixture of finely divided particles of BO_2, $Bi_2O_2CO_3$ and carbonate(s) of M when x is greater than zero at a temperature between the thermal decomposition temperature of $Bi_2O_2CO_3$ and 650° C. in an oxidizing atmosphere to form a reaction product comprising



Bi_2O_3, $Bi_{2-x}M_xB_2O_{7-z}$ and oxide(s) of M, the mole ratio of Bi to B being at least 1.4 to 1;

(b) forming a dispersion of the fired reaction product of step (a) in dilute aqueous mineral acid in an amount and for a time sufficient to dissolve substantially all the Bi_2O_3 and, if present, oxides of M in the reaction product; and

(c) separating the acid-treated reaction product of step (b) from the dispersion medium.

4,420,423

METHYL SUBSTITUTED-2-OXOHEXANE DERIVATIVES AND PROCESS FOR PREPARING AND USING SAME

Richard M. Boden, Monmouth Beach; Lambert Dekker, Wyckoff; Frederick L. Schmitt, Holmdel, all of N.J., and Augustinus G. Van Loveren, Rye, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 195,630, Oct. 9, 1980, Pat. No. 4,335,009, which is a continuation-in-part of Ser. No. 160,788, Jun. 19, 1980, Pat. No. 4,287,084. This application Feb. 4, 1982, Ser. No. 345,666

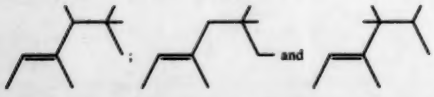
The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

Int. Cl.³ A61K *7/46*

U.S. Cl. 252—522 R **6 Claims**

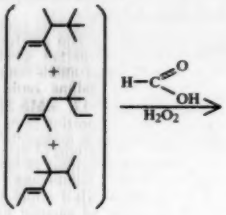
1. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of intimately admixing with the perfume composition or cologne or perfumed article, an aroma augmenting or enhancing quantity of a product produced according to the process consisting of the steps of:

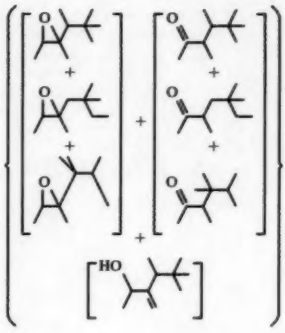
(i) dimerizing two moles of isoamylene in the presence of an acidic atalyst to form diisoamylene which is a mixture of molecules having the structures:



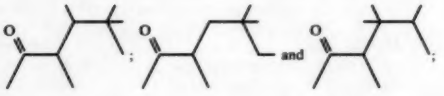
having a distillation range of 36°–40° C., vapor temperature; 74°–94° C. liquid temperature and 4–5 mm/Hg pressure;

(ii) intimately admixing the resulting diisoamylene mixture with concentrated hydrogen peroxide and formic acid whereby a mixture of alcohols, epoxides and ketones is formed according to the reaction:



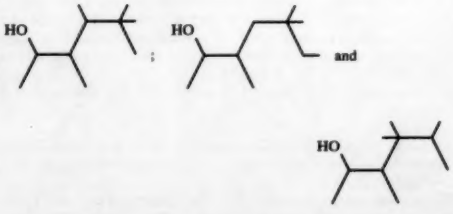


(iii) distilling the resulting reaction product at a temperature in the range of 93°–100° C. vapor temperature; 109°–120° C. liquid temperature at 50 mm/Hg pressure in order to isolate a mixture of compounds having the structure:



and

(iv) intimately admixing the resulting mixture with an alkali metal borohydride whereby a mixture of compounds is formed having the structures:



distilling at a vapor temperature in the range of 90°–93° C.; a liquid temperature in the range of 97°–108° C. and a pressure of 14 mm/Hg.

4,420,424

NEW PEPTIDES AND A PROCESS FOR THEIR PREPARATION

Rolf Geiger, Frankfurt am Main; Wolfgang König, Hofheim am Taunus, and Gerd Johnscher, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 188,820, Sep. 19, 1980, abandoned. This application Nov. 9, 1981, Ser. No. 319,267

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938420

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R 11 Claims

1. A peptide of the formula

G—K—Q—X—M

wherein

G is arginine, lysine, ornithine, or homoarginine, all in the L- or their D-configuration, or is unsubstituted ω-aminoalkanoyl, ω-guanidinoalkanoyl, or ω-dimethylaminoalkanoyl having 3–6 C atoms, or is such ω-aminoalkanoyl, ω-guanidinoalkanoyl, or ω-dimethylaminoalkanoyl substituted with an d amino group in the L- or D-configuration, which amino group in turn may carry

alkanoyl having 1–6 C atoms,

aroyl having 7–11 C atoms,

cycloalkanoyl having up to 2 alkyl C atoms and 5–7 cycloalkyl C atoms,

aralkanoyl having up to a total of 9 C atoms and wherein a $—CH_2—$ group can be replaced by —O— or —S—, alkoxycarbonyl or aralkyloxycarbonyl having up to 7 carbon atoms, or

succinoyl, succinamoyl, glutaroyl, glutaminyl, pyroglutamyl, phthaloyl, phthalamidyl, or 2-carboxybenzoyl;

K is a basic amino acid;

Q is L- or D-glutamic acid, D-aspartic acid, or D-α-aminoadipic acid;

X is L-valine or L-isoleucine; and

M is an L- or D-aminoacid having a hydrophobic side chain, or is an ester, amide, alkylamide, or alkylester having 1–6 C atoms of such an acid, or is an aralkylester having 7–10 C atoms of such an acid.

4,420,425

METHOD FOR PROCESSING PROTEIN FROM NONBINDING OILSEED BY ULTRAFILTRATION AND SOLUBILIZATION

James T. Lawhon, College Station, Tex., assignor to The Texas A&M University System, College Station, Tex.

Filed Aug. 2, 1982, Ser. No. 404,125

Int. Cl.³ A23J *1/14*

U.S. Cl. 260—123.5 46 Claims

1. A method of processing nonbinding oilseeds comprising the steps of:

solubilizing at least a portion of the protein contained in the oilseed to produce a filterable protein feed stream; and

passing the protein feed stream through an ultrafiltration membrane system with a molecular weight cutoff of about 70,000 daltons to separate out proteins, while controlling the concentration of the feed to limit self filtering and produce a permeate and a retentate, the retentate having a substantially bland taste and colorless appearance when dried.

4,420,426

6-ALPHA-HALOPENICILLANIC ACID 1,1-DIOXIDES

Bernard S. Moore, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 17,810, Mar. 5, 1979, abandoned. This application Dec. 9, 1980, Ser. No. 214,757

Int. Cl.³ C07D *499/00*

U.S. Cl. 260—245.2 R 7 Claims

1. (2S,5R,6S)-6-alpha-Bromo-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid, S,S-dioxide, or a base salt thereof or a readily hydrolyzable ester thereof.

4,420,427

PROCESS FOR THE SEPARATION OF STEROLS OR MIXTURES OF STEROLS

Antti Hamunen, Lappeenranta, Finland, assignor to OY Kaukas AB, Lappeenranta, Finland

Filed Jul. 8, 1982, Ser. No. 396,336

Claims priority, application Finland, Jul. 21, 1981, 812278

Int. Cl.³ C07J *9/00*

U.S. Cl. 260—397.25 10 Claims

1. A process for the separation of one or more sterols or mixtures of sterols selectively from sterol-containing unsaponifiable material obtained from sulphate soap, saponifiable vegetable oils, tall oil or any other material of vegetable origin, comprising the steps of:

(a) adding to the sterol-containing fraction a solvent selected from the group consisting of methanol, ethanol, a mixture of methanol and ethanol, and a mixture of methyl ethyl ketone and water containing more than 5% by weight of water, wherein the weight ratio of sterol-containing material:solvent = 1:0.2 to 1:20,

(b) mixing the mixture of solvent and sterol-containing fraction at room temperature, heating said mixture, when required, for dissolving undesired neutral components and cooling to room temperature or below it,

(c) filtering precipitated sitosterol, and

(d) removing the non-sterolic components in the sitosterol precipitate by washing the precipitate with a suitable solvent.

4,420,428

16-KETOANDROSTENE-17-DITHIOKETALS

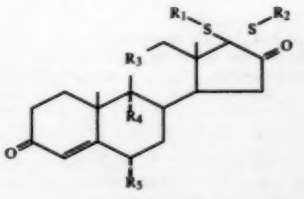
Ravi K. Varma, Belle Mead, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 27, 1982, Ser. No. 453,314

Int. Cl.³ C07J *7/00*

U.S. Cl. 260—397.45 13 Claims

1. A steroid having the formula



or 1,2-dehydro and 6,7-dehydro derivatives thereof, wherein R_1 and R_2 are the same or different and each is alkyl, cycloalkyl or aryl;

R_3 is carbonyl, β-hydroxymethylene or β-acetyloxymethylene;

R_4 is hydrogen or halogen; and

R_5 is hydrogen, methyl, hydroxy, alkanoyl, alkanoyloxy, or halogen.

4,420,429

PRODUCTION OF ALKYL ESTERS OF SATURATED ALIPHATIC CARBOXYLIC ACIDS

Wolfgang H. E. Müller, and Peter Hofmann, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls A.G., Marl, Fed. Rep. of Germany

Filed Aug. 11, 1981, Ser. No. 291,952

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034421

Int. Cl.³ C11C 3/02

U.S. Cl. 260—410.9 R 10 Claims

1. In a process for preparing an alkylester of a saturated aliphatic carboxylic acid by:

(a) reacting at elevated temperatures and pressure, input material comprising olefin, alkanol and carbon monoxide in the presence of a catalyst consisting of a cobalt compound and a promoter selected from the group consisting of pyridine, non-ortho-substituted alkylpyridine, and mixtures thereof to form a reaction mixture containing water, said alkylester, unreacted olefin, unreacted promoter, catalyst residue, and unreacted alkanol;

(b) separating alkylester from said water, unreacted olefin, unreacted promoter, catalyst residue, and unreacted alkanol;

(c) regenerating said catalyst residue; and

(d) feeding back to step (a) said water, said unreacted olefin, said unreacted promoter, said regenerating catalyst, and said unreacted alkanol, the improvement comprising:

(e) separating water from the groups consisting of said water and said unreacted alkanol or said water and said unreacted promoter.

4,420,430

METHOD FOR PREPARING ORGANO GERMANIUM PROPIONIC ACID DERIVATIVES

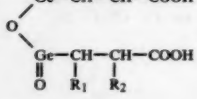
Ching-Te Chang, Taipei; Lian-Tze Lee, Hsinchu, both of Taiwan, and Hsueh-Ling Su, St. Paul, Minn., assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Feb. 1, 1982, Ser. No. 344,375

Int. Cl.³ C07F 7/30

U.S. Cl. 260—429 R 17 Claims

1. A process for preparing an organo germanium sesquioxide derivative of the following formula (II):



(II)

where R_1 and R_2 are independently hydrogen or lower alkyl, comprising in combination the steps of:

(i) reacting germanium tetrachloride with hypophosphorous acid or its salts, whereby the germanium tetrachloride is reduced,

(ii) thereafter adding to the reaction mixture an acrylic acid derivative of the following formula (I):

(I)

where R_1 and R_2 are as previously defined and Y is COOH, COOR (R being lower alkyl), $CONH_2$ or CN, and

(iii) hydrolyzing the product of step (ii) whereby the said compound of formula II is formed.

4,420,431

SALTS OF 3-CYANO-3-ALKENE-SULFINIC ACIDS AND SALTS OF 3-CARBAMOYL-3-ALKENE SULFONIC ACIDS AND PREPARATIONS THEREOF

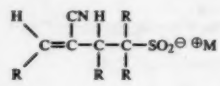
Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 13, 1979, Ser. No. 11,744

Int. Cl.³ C07C 120/00, 121/30, 121/66, 143/16

U.S. Cl. 260—465.9 11 Claims

1. Salts of 3-cyano-3-alkenesulfinic acids which correspond to formula I



I

wherein the R groups are hydrogen or alkyl, cycloalkyl and phenyl groups containing from 1 to 6 carbon atoms per group or alkoxy-substituted alkyl and cycloalkyl groups containing from 2 to 6 carbon atoms per group, with the further proviso that compounds of formula I contain a maximum of 12 carbon atoms per molecule and wherein M is an alkali metal or quaternary ammonium group of up to and including 6 carbon atoms.

4,420,432

CRYSTALLINE SALT OF BASIC L-AMINO ACID WITH L-MALIC ACID AND PROCESS FOR THE PREPARATION THEREOF

Ichiro Chibata, Suita; Akihiko Sumi, Ashiya; Hiroshi Ito, Itami; Osamu Ohtsuki, Nagaokakyo, and Nozomu Izutsu, Yao, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

Continuation of Ser. No. 93,810, Nov. 13, 1979, abandoned. This application Jan. 5, 1982, Ser. No. 337,320

Claims priority, application Japan, Nov. 20, 1978, 53-143603; Apr. 6, 1979, 54-42378

Int. Cl.³ C07C 101/00

U.S. Cl. 260—501.11 6 Claims

1. A method for preparing a neutral crystalline salt of a basic L-amino acid and L-malic acid which comprises reacting 2 moles of said L-amino acid taken from the class consisting of L-ornithine, L-arginine, and L-lysine with 1 mole of L-malic acid in an aqueous medium, concentrating the reaction mixture until it contains about 20% to about 70% by weight of said neutral salt, mixing the concentrated mixture with a hydrophilic organic solvent taken from the class consisting of an alkanol of 1 to 3 carbon atoms, an alkanone of 3 to 5 carbon atoms, N-N'-dimethylformamide and mixtures thereof, to a water content of the system for crystallization of about 10% to about 30% by volume, crystallizing said neutral salt and recovering said salt from the reaction mixture.

4,420,433

PROCESS FOR THE PREPARATION OF FLUORINE-SUBSTITUTED CARBOXYLIC ACID CHLORIDES AND THEIR USE

Rudolf Braden, and Erich Klauke, both of Odenthal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 9, 1982, Ser. No. 396,568

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129274

Int. Cl.³ C07C 51/58

U.S. Cl. 260—544 D 20 Claims

1. A process for the preparation of a fluorine-substituted carboxylic acid chloride which comprises contacting a fluorine substituted carboxylic acid fluoride at an elevated temperature with silicon tetrachloride or titanium tetrachloride.

4,420,434

PERFLUORALKYL ANION/PERFLUOROALKYL CATION ION PAIR COMPLEXES

Robert A. Falk, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 9, 1981, Ser. No. 223,640
Int. Cl.³ C07C 143/00, 53/00
U.S. Cl. 260—501.12 4 Claims

1. A hydrolytically stable ion pair complex of the formula

$$R_f\text{—A—Q}^{\ominus}.\text{N}^{\oplus}(R_1)(R_2)(R_3)\text{—A'—}R_f'$$

wherein

R_f and R_f' independently represent perfluoroalkyl of 4 to 12 carbon atoms;

A and A' independently represent

$$\text{—}CH_2CH_2\text{—S—alkylene—G''—alkylene—}$$

where G'' is independently —SO_2NH—, —CONH— or

and each alkylene is straight or branched chain alkylene of 1 to 6 carbon atoms;

R_1, R_2 and R_3 are independently hydrogen, phenyl, alkyl of 1 to 8 carbon atoms which is unsubstituted or is substituted by halo, hydroxy or phenyl; or is $-CHR_4CH_2O)_yR_5$ where y is 1 to 20, R_4 is hydrogen or alkyl of 1 to 4 carbon atoms and R_5 is hydrogen or methyl; or R_1 and R_2 taken together with the nitrogen to which they are attached represent piperidino, morpholino or piperazino; or R_1, R_2 and R_3 taken together with the nitrogen to which they are attached represent pyridinium or pyridinium substituted by alkyl of 1 to 4 carbon atoms; and

Q represents the carboxy, sulfo, phosphato or phosphono anion.

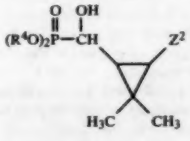
4,420,435

ALPHA-HYDROXY-PHOSPHONIC ACID ESTERS

Hellmut Hoffmann; Fritz Maurer, both of Wuppertal; Uwe Priesnitz, Unna-Massen, and Hans-Jochem Riebel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 140,644, Apr. 16, 1980, Pat. No. 4,358,409.
This application Jun. 22, 1982, Ser. No. 391,092
Claims priority, application Fed. Rep. of Germany, May 2, 1979, 2917620; Jul. 21, 1979, 2929636
Int. Cl.³ C07F 9/40
U.S. Cl. 260—940 1 Claim

1. An α-hydroxy-phosphonic acid ester of the formula



in which

R^4 each independently represents alkyl or phenyl or the two radicals R^4 together represent alkylene and

Z^2 represents cyano, carbamoyl, acetyl or C_1–C_4-alkoxycarbonyl.

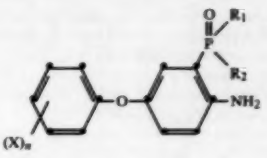
4,420,436

2-SUBSTITUTED 5-PHENOXYPHENYLPHOSPHONIC ACID DERIVATIVES

Ludwig Maier, Arlesheim, and Dieter Dürr, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 117,167, Jan. 31, 1980, Pat. No. 4,322,375.
This application Dec. 28, 1981, Ser. No. 334,862
Claims priority, application Switzerland, Feb. 6, 1979, 1147/79
Int. Cl.³ C07F 9/40, 9/44; A01N 57/22
U.S. Cl. 260—944 3 Claims

1. A 2-substituted 5-phenoxyphenoxphosphonic acid derivative of the formula



wherein

each of R_1 and R_2 is hydroxy, lower alkoxy, lower alkylthio, alkylamino, dialkylamino, chlorine, benzyloxy or benzylthio,

X is halogen, —CF_3, —NO_2, —CN, —$CONH_2$ or —$CSNH_2$, and

n is an integer from 0 to 2.

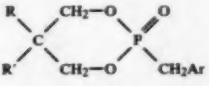
4,420,437

PREPARATION OF A 2-ARALKYL-5,5-DIALKYL-1,3,2-DIOXAPHOSPHORINAN-2-ONE FROM 2-ARALKOXY-5,5-DIALKYL-1,3,2-DIOXAPHOSPHORINANE

Peter F. Epstein, Glen Burnie, Md.; Richard D. Peveler, Wyckoff, and Michael H. Fisch, Wayne, both of N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Filed Aug. 6, 1981, Ser. No. 290,532
Int. Cl.³ C07F 9/40
U.S. Cl. 260—969 5 Claims

1. A process for preparing a 2-aralkyl-5,5-dialkyl-1,3,2-dioxaphosphorinan-2-one having the formula:



in which R is an alkyl group having 1 to 2 carbon atoms and R' is an alkyl group having 1 to 9 carbon atoms, and Ar is an aryl group having 6 to 18 carbon atoms, that comprises heating a 2-aralkyloxy-5,5-dialkyl-1,3,2-dioxaphosphorinane with a catalytic quantity of an aralkyl halide the halide being selected from the group consisting of bromine, chlorine and iodine, and recovering a 2-aralkyl-5,5-dialkyl-1,3,3-dioxaphosphorinan-2-one from the mixture.

4,420,438

CARBURETOR THROTTLE VALVE METHOD AND APPARATUS

Carl C. Goosen, Rte. 3, Box 1250, Palomino Way, Oviedo, Fla. 32765

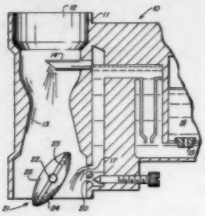
Filed Dec. 9, 1981, Ser. No. 328,860
Int. Cl.³ F02M 9/08
U.S. Cl. 261—65 4 Claims

1. An internal combustion engine carburetor throttle comprising in combination:

an engine carburetor having at least one air intake and one fuel inlet and a passageway therethrough into the intake manifold of the engine;

a throttle shaft rotatably mounted below the venturi in said passageway through said carburetor having a throttle plate attached thereto;

a pair of air foil segments, one segment attached to each side of said throttle shaft and to each other, said throttle segments and throttle plate forming a predetermined shaped air foil for streamlining the fluid flow into the intake



manifold of said engine, said pair of segments attached to said throttle shaft and throttle plate forming a generally lenticular shape with said existing throttle plate with each segment having a groove therein on a flat side thereof for fitting over a portion of said throttle shaft and each segment being mounted offset to said throttle shaft to line up with tapered edges of said throttle plate to form an air foil with said throttle plate; and

one said air foil segment being threaded for receiving a screw through the other air foil segment and through the throttle shaft.

4,420,439

CONSTANT PRESSURE CARBURETTORS

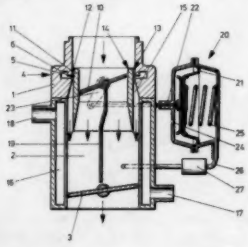
Günter Härtel, Neuss; Armin Schürfeld, and Anwar Abidin, both of Meerbusch, all of Fed. Rep. of Germany, assignors to Bösch & Pierburg System oHG, Neuss, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 343,974

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1981, 3104559

Int. Cl.³ F02M *15/04*

U.S. Cl. 261—142 **24 Claims**



1. A constant pressure carburettor for an internal combustion engine, said carburettor comprising a mixing chamber, a tubular wall surrounding said mixing chamber, a selectively actuatable main throttle valve located downstream of said mixing chamber, an inner tube located within and substantially concentrically with said tubular wall, a choke valve located adjacent the upstream end of said inner tube upstream of said mixing chamber, said choke valve being openable in dependence upon the magnitude of the air flow through said carabu-rettor, at least one duct located between said tubular wall and said inner tube and said duct extending in the direction of air flow through said carburettor and leading into said mixing chamber from a location upstream of said mixing chamber, said duct has a flow cross-sectional area which is small compared to that of said inner tube, said at least one duct is provided with a flow constricting profile at the inlet end thereof for constricting the flow through said duct for producing a stable air flow through said duct, and a fuel distributing device for discharging fuel into said at least one duct downstream of said flow restricting profile, said distributing device including fuel metering means controlled by said choke valve, wherein the improvement comprises a partition wall located within said mixing chamber, said partition wall extending in the direction of air flow through said mixing chamber and substantially preventing air flow transverse of the direction of said air flow through said mixing chamber, and said fuel distributing device arranged for supplying fuel onto said tubular wall.

4,420,440

FILM CARTRIDGE MANUFACTURE AND FILLING METHOD AND APPARATUS

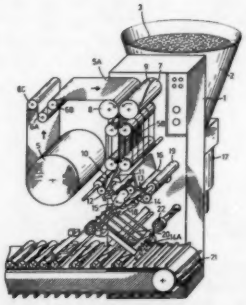
Horst F. Marz, Otterburn Park, Canada, assignor to C-I-L Inc., North York, Canada

Filed Dec. 15, 1982, Ser. No. 450,144

Claims priority, application Canada, Feb. 2, 1982, 395363

Int. Cl.³ C06B *21/00*

U.S. Cl. 264—3 B **9 Claims**



1. A method for packing viscous, gel-like explosives into convolute paper tubes which comprises the steps of

(a) feeding a pre-cut section of paper film to a continuously rotating, hollow winding/extrusion mandrel to form a cylindrical convolutely wound paper shell thereon,

(b) closing one end of the said paper shell upon the said mandrel by means of an inwardly folded crimp,

(c) extruding a cylindrical column of viscous, gel-like explosives through a tubular element within the said hollow mandrel and into and against the crimp-closed end of said paper shell, the said shell being simultaneously slid along the said mandrel by the force of the explosive extrudate,

(d) cutting and separating the said cylindrical explosive column at a point adjacent the leading open end of the said mandrel and indented within the said paper shell to provide an unfilled paper shell end portion,

(e) displacing the said filled paper shell from the said mandrel,

(f) restraining the said displaced, filled shell in a holding means, and

(g) closing the said open end of said restrained filled shell by means of an inwardly folded crimp.

4,420,441

METHOD OF MAKING A TWO-PHASE OR MULTI-PHASE METALLIC MATERIAL

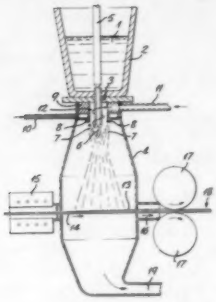
Alfred R. E. Singer, Swansea, Wales, assignor to National Research Development Corp., London, England

Filed Feb. 15, 1983, Ser. No. 466,474

Claims priority, application United Kingdom, Feb. 23, 1982, 8205347; Jul. 20, 1982, 8220970

Int. Cl.³ B29C *6/00*

U.S. Cl. 264—7 **17 Claims**



1. A method of making a multi-phase metallic material comprising elemental or metallic particles of a high-melting-point phase dispersed in a lower-melting-point metallic matrix phase (the particles being of a material which would be soluble under equilibrium conditions in the matrix material at the melting point of the matrix material), wherein the method comprises forming a spray of molten matrix material, introducing the particles into the spray, and directing the spray onto a colder surface to solidify the matrix spray and form the multi-phase material, wherein the temperature of the spray is below the melting point of the particles, with the result that, despite the notional solubility of the particles material, no perceptible dissolution of particles occurs.

4,420,442

MANUFACTURING PROCESS FOR HOLLOW MICROSPHERES

Bruce W. Sands, Malvern, Pa., assignor to PQ Corporation, Valley Forge, Pa.

Division of Ser. No. 253,139, Apr. 13, 1981, abandoned. This application Sep. 21, 1982, Ser. No. 421,002

Int. Cl.³ B29C *6/00*

U.S. Cl. 264—13 **6 Claims**

1. In the process of preparing hollow microspheres by spray drying an aqueous dispersion of film-forming substance and recovering the product the improvement consisting of adding a porosity reducing amount of a water miscible organic solvent selected from the group consisting of cellosolve, cellosolve acetate, ethyl cellosolve, diglyme and tetraglyme with a boiling point of at least 100° C. prior to spray drying.

4,420,443

METHOD FOR PRODUCING SPHERICAL PARTICLES OF CARBON AND OF ACTIVATED CARBON

Hisatsugu Kaji, and Kazuhiro Watanabe, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

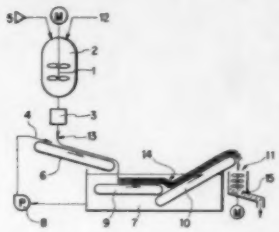
Continuation-in-part of Ser. No. 201,928, Oct. 29, 1980, abandoned. This application Dec. 9, 1982, Ser. No. 448,267

Claims priority, application Japan, Nov. 2, 1979, 54-142154

Int. Cl.³ B22B *11/01*

U.S. Cl. 264—15 **3 Claims**

1. In the method for producing spherical particles of carbon from a carbonaceous pitch, wherein said pitch is mixed with a viscosity-reducing agent, the pitch viscosity-reducing agent mixture is heated and formed into spherical particles, the viscosity-reducing agent is extracted from the spherical particles, said particles are then infusibilized and baked or activated to obtain the spherical particles of carbon, wherein the improvement comprises: melt-extruding said mixture through a nozzle to form string-like bodies; simultaneously cooling and stretching the string-like bodies by letting said bodies flow together with a water flow rate of 0.5 to 5 m/sec on a inclined conduit or an inclined belt-conveyer to form a mixture of brittle string-



like bodies of 0.2 to 2.5 mm in diameter; breaking the brittle string-like bodies into stick-like bodies with a length to diameter ratio of 1 to 5; putting the stick-like bodies into hot water kept at a temperature higher than the softening point of the mixture, thereby transforming the stick-like bodies into the spherical particles; cooling the spherical particles by putting said particles into cold water kept at a temperature lower than the softening point of the mixture; and collecting the spherical particles of the mixture which are solid at ordinary temperature.

4,420,444

PROCESS FOR FORMING PHOSPHOR POWDER LAYER

Hiromichi Yamada, Hino; Atsushi Suzuki; Yoichi Oba, both of Higashiyamato; Yoko Uchida, Kawasaki; Hideki Kohno, Tokyo; Tadashi Fukino, Hachioji, and Minoru Yoshida, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Dec. 8, 1981, Ser. No. 328,623

Int. Cl.³ C09K *11/00*

U.S. Cl. 264—21 **13 Claims**

1. A process for forming a phosphor powder layer which comprises a step of mixing a phosphor powder with a polymer emulsion, said polymer emulsion having a solid content of 4 to 33% by weight based on the weight of the phosphor powder, a step of drying the mixture, a step of pulverizing the resulting dried mixture to give the phosphor powder coated with a polymer, and a step of molding the phosphor powder coated with the polymer in a mold under pressure and heat.

4,420,445

COAL PELLETS PRODUCTION

Sueshi Yamamoto, Tokyo; Kenichi Nagata, Yachiyo; Jisaku Tanimichi, Yokohama, and Yoshiharu Takebe, Tokyo, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1982, Ser. No. 337,169

Claims priority, application Japan, Jul. 10, 1980, 54-94155

Int. Cl.³ B01J *2/12*

U.S. Cl. 264—40.4 **2 Claims**

1. A method of making fuel pellets from coal particles, comprising:

(a) milling raw coal to form a mixture of coal particles comprising:

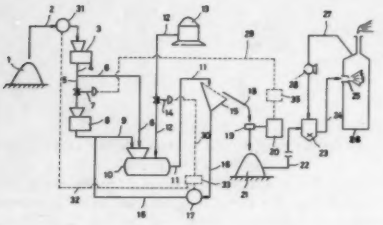
1. 50–75 wt. % of coarse coal particles having a maximum particle size of 3–7 mm, and

2. 50–25 wt. % of fine coal particles having a maximum particle size of 0.5 mm,

(b) introducing the mixture of coal particle sizes into a pelletizer.

(c) introducing into said mixture in said pelletizer a hydrocarbon oil binder for said coal particles, in an amount of 1–8 wt. % of said mixture,

(d) treating said coal mixture and binder in said pelletizer to



form coal pellets having said fine particles attached about the coarse particles,

(e) measuring the yield of said coal pellets produced in said pelletizer, and controlling the amount of binder oil added to said mixture, based upon said measured pellet yield, and

(f) measuring values for grindability of said produced coal pellets, and controlling the composition of said coarse and fine particles in said formed mixture in step (a) on the basis of said measured grindability values.

4,420,446

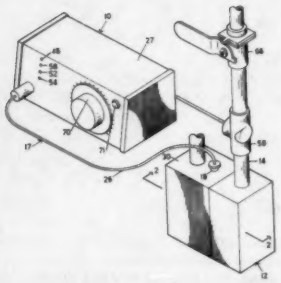
METHOD FOR MOLD TEMPERATURE CONTROL

Horst K. Wieder, Watertown; Klaus A. Wieder, Helenville, and Joseph Haberkorn, Watertown, all of Wis., assignors to Cito Products, Inc., Watertown, Wis.

Division of Ser. No. 179,886, Aug. 20, 1980, Pat. No. 4,354,812. This application Mar. 15, 1982, Ser. No. 357,920

Int. Cl.³ B29C *25/00*

U.S. Cl. 264—40.6 **1 Claim**



1. A method of controlling the temperature of a fluid cooled mold having cooling channels therein comprising the steps of:

(a) injecting liquid plastic into the mold to thereby raise its temperature;

(b) simultaneously sensing the temperature of the mold;

(c) simultaneously comparing the sensed temperature to a selected control temperature indicative of the proper operating temperature of the mold;

(d) passing a flow of cooling fluid through the cooling channels in the mold when the sensed temperature of the mold is above the selected control temperature;

(e) cutting off the flow of cooling fluid through the mold such that cooling fluid dwells in the cooling channels of the mold when the sensed temperature drops below the selected control temperature;

(f) again injecting liquid plastic into the mold to raise its temperature;

(g) again passing a flow of cooling fluid through the cooling channels in the mold when the sensed temperature of the mold is above the selected control temperature; and

(h) again cutting off the flow of cooling fluid through the mold such that cooling fluid dwells in the cooling channels of the mold when the sensed temperature drops below the selected control temperature.

4,420,447

PROCESS FOR PRODUCING FOAM MOLDINGS WITH AN INSERT

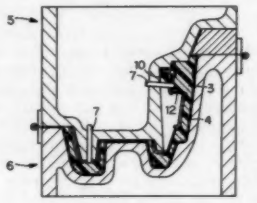
Akira Nakashima, Komaki, Japan, assignor to Tokai Chemical Industries, Ltd., Komaki, Japan

Filed Jan. 5, 1982, Ser. No. 337,171

Claims priority, application Japan, Jan. 16, 1981, 56-5806

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—46.4 **10 Claims**



1. A process for producing a foam molding including an insert of predetermined shape wherein the insert is set in a mold consisting essentially of a core block and a cavity block for foaming a foamable material in a cavity defined in said mold so as to form a foamed body on one side of said insert, said process comprising the steps of:

preparing an insert assembly consisting of said insert and a film having portions adhering to a surface of said insert on said one side thereof, said film extending so as to match a partial profile of said foamed body and covering a surface of said core and cavity blocks, said film further having skirt portions adapted to extend between respective joining portion of said core and cavity blocks;

setting said insert assembly on said one of the core and cavity blocks such that said skirt portions extend over the surface of said joining portion of the one block;

enclosing said cavity by joining said core and cavity blocks such that said skirt portions are pinched by said joining portions; and

pouring said foamable material into a space formed between said film and a surface of the other blocks to define said cavity.

4,420,448

POLYMER FOAM PROCESS

Charles M. Krutchen, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

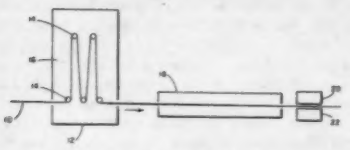
Filed Aug. 26, 1982, Ser. No. 412,044

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—53 **19 Claims**

1. A method for treating foamed styrene polymer sheet

comprising exposing said polymer sheet to an atmosphere of at least substantially carbon dioxide at a temperature sufficient to



cause transpiration, absorption or dissolution of carbon dioxide into said polymer.

4,420,449

PROCESS FOR PRODUCING ARTICLES FROM POLYTETRAFLUOROETHYLENE

Zenas Crocker, Osterville, Mass., and A. Nelson Wright, St. Agathe des Monts, Canada, assignors to Synergistics Chemicals Limited, Concord, Canada

Filed Apr. 19, 1982, Ser. No. 369,584

Int. Cl.³ B29C *19/02*

U.S. Cl. 264—68 **16 Claims**

1. A process for production of a shaped polytetrafluoroethylene article comprising:

introducing polytetrafluoroethylene granules into a high intensity mixer comprising an enclosed container having a plurality of blades rotatable on arms about a central axis;

rotating said blades at a blade tip speed of at least 30 meters per second whereby the polytetrafluoroethylene granules are subjected to an intense mixing and thermokenetic heating action of the rotating blades until the granules become heated to a predetermined discharge temperature of above 370° C.;

discharging the polytetrafluoroethylene granules at said discharge temperature;

forming the discharged, heated, granules into an article of desired shape at or below said discharge temperature; and

cooling the shaped article.

4,420,450

MANUFACTURE OF SPRINGS OF FIBRE REINFORCED COMPOSITE MATERIAL

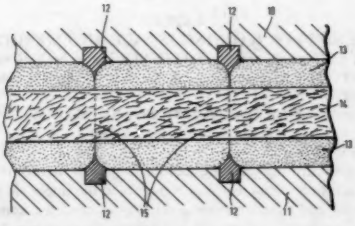
Barry J. Marsh, Penkridge, England, assignor to GKN Technology Limited, Wolverhampton, England

Filed Mar. 16, 1982, Ser. No. 358,594

Claims priority, application United Kingdom, Mar. 21, 1981, 8108916

Int. Cl.³ B28B *11/12*

U.S. Cl. 264—118 **6 Claims**



1. In a method of manufacturing leaf springs from composite, fibre reinforced resin material, the method comprising:

forming an assembly of resin impregnated fibres of sufficient width to constitute a number of individual springs in side-by-side relationship;

subjecting the assembly to a moulding process including a treatment to cure the resin and set the fibres therein;

cutting the cured assembly along at least one plane extending longitudinally of the assembly and between opposed surfaces thereof to form said individual springs;

the improvement comprising forming, during said moulding process, depressions in said surfaces along said planes where the assembly is to be cut, whereby fibres adjacent said surfaces remain undisturbed by said cutting.

4,420,451

METHOD FOR FILM EXTRUSION COMPRISING ROTARY DIE PARTS

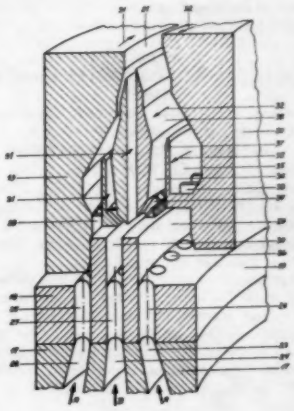
Ole-Bendt Rasmussen, 7, Topstykket, 3460 Birkeroed, Denmark

Continuation of Ser. No. 803,896, Jun. 6, 1977, abandoned, which is a division of Ser. No. 592,273, Jul. 1, 1975, Pat. No. 4,039,364. This application Oct. 7, 1980, Ser. No. 194,862

Claims priority, application United Kingdom, Jul. 5, 1974, 29807/74; Dec. 11, 1974, 53644/74

Int. Cl.³ B29F *3/10*

U.S. Cl. 264—173 **3 Claims**

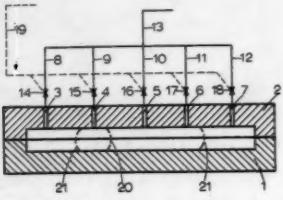


1. A method of extruding a laminated polymer sheet of improved properties comprising the steps of extruding in an extrusion die a dispersion of two molten polymer materials in at least two generally concentric tubular streams rotating relative to one another, subjecting the respective tubular streams during such extrusion to significant attenuation generally in the direction of extrusion flow to attenuate and elongate the dispersed polymer material, combining the separate attenuated tubular streams into a common stream while continuing the extrusion thereof, discharging the common stream while the polymers therein remain in molten condition from said die through an exit passage defined by two generally concentric spaced apart cylindrical walls while rotating such walls in generally opposite relative directions whereby the opposite surfaces of the common extruded stream contiguous to such walls are subjected while passing through said exit passage to the smearing action of said rotating walls to thereby peripherally shear out the attenuated polymer dispersion through the thickness of the common stream, allowing the common extruded stream to solidify after emergence from such exit passage, and finally collecting the thus solidified tubular sheet.

4,420,452
PROCESS AND DEVICE FOR INJECTION-MOLDING PLASTICS

Hendrik van Dalen, Geleen, and Willem Schlösser, Kerkrade, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Jun. 26, 1981, Ser. No. 277,854
Int. Cl.³ B29F *1/00*
U.S. Cl. 264—328.8 **4 Claims**



1. A process for the injection-molding of plastic material consisting essentially in:

initially introducing the material charge into a mold having a plurality of entry gates through less than all of said gates, and subsequently introducing the material through at least one additional entry gate only after said flow front has passed said additional gate.

4,420,453
METHOD OF MAKING POLYESTER CORD RADIAL TIRES

Myron T. Ayers, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Aug. 13, 1980, Ser. No. 177,710
Int. Cl.³ B29C *25/00*
U.S. Cl. 264—502 **1 Claim**

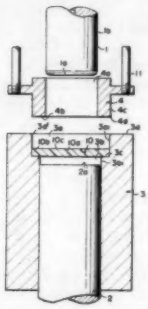
1. A method of making a polyester cord tire including the curing of the tire under heat and pressure in a mold at a curing temperature of at least 335° F. (168° C.) and then post-cure inflating the tire outside the mold to a pressure of at least 120 kilopascals before the tire cools below the heat shrink temperature of the polyester cord, wherein the improvement comprises a time delay between said curing of the tire in a mold and said post-cure inflation, the length of said time delay being such as to allow the temperature of the polyester cords in said tire underneath the tread shoulder portions of the tire to fall to between 295° F. and 305° F. (146° C. to 152° C.).

4,420,454
METHOD OF MAKING A PLASTIC HOLLOW ARTICLE

Kiyoshi Kawaguchi, Yokohama; Muneki Yamada, Fujisawa; Nobuyuki Kato, Yokohama; Fumio Kanou, Yokohama; Akira Sakamoto, Yokohama, and Minoru Mitsuhashi, Tokyo, all of Japan, assignors to Toyo Seikan Kaisha, Limited, Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 355,147
Int. Cl.³ B29C *17/03, 17/04;* B29D *9/04*
U.S. Cl. 264—512 **15 Claims**

1. A method of making a plastic hollow article having a flange portion, a sidewall portion and a bottom wall portion, at least said sidewall portion being molecularly oriented, which comprises clamping a peripheral portion corresponding to said flange portion of a flat, molecularly orientable plastic material stock of substantially uniform thickness having a temperature below the upper limit of the molecularly orientable temperatures of said plastic material, such that the material of the peripheral portion will not flow radially, inwardly; thereafter introducing the central portion of said plastic material stock substantially corresponding to said bottom portion into a die cavity by moving a first plunger and a second plunger in said die cavity while compressing said central portion between said first plunger and said second plunger, said first and second plungers being moveable between an original position and a second position, said die cavity having a straight, axially extending inside surface with a clearance between said inside surface and a side surface of said first plunger being larger than the thickness of a sidewall portion of a hollow preform to be formed, such that the compressing force by the first plunger and the second plunger is kept comparatively high in a beginning stage of introducing the plastic material stock into the die cavity, thereby causing the plastic material forced out to substantially fill the space between the first plunger and the inside surface of said die cavity, and thereafter the compressing force is reduced and said introducing is continued to said position thereby permitting the filled plastic material to be drawn in the



axial-direction, to form a hollow preform having a sidewall portion made from the plastic material which has been forced out from between the first plunger and the second plunger, said sidewall portion being kept in contact with the side surface of the first plunger kept at about molecularly orientable temperature; withdrawing the first plunger from said second plunger to said original position thereof and supplying a fluid under pressure, during said withdrawing, into said hollow preform to expand radially said sidewall portion, so that said sidewall portion is brought into contact with the inside of said die cavity kept at a temperature below the lower limit of said molecularly orientable temperatures for cooling and solidifying, whereby said sidewall portion of said plastic hollow article is formed from said sidewall portion of said hollow preform.

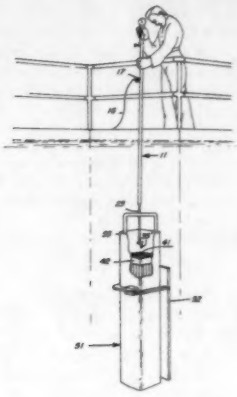
4,420,455
END PLUG GAUGING DEVICE AND METHOD

Frank D. Qurnell, and Nordahl H. Skarshaug, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Feb. 12, 1981, Ser. No. 233,841
Int. Cl.³ G21C *17/00;* G01B *5/14*
U.S. Cl. 376—245 **13 Claims**

1. An end plug gauging device for use in determining the axial position of nuclear fuel elements in the upper tie plate of a reactor fuel bundle submerged in a pool of water, comprising mounting means for mounting a position indicator including a plunger for actuating said indicator in proportion to the degree of depression of the plunger, said mounting means including a lower end for placement on a reference plane defined by the submerged upper surface of said upper tie plate, and means slidably, coaxially mounted within said mounting means, said means slidably mounted being in cooperation with said plunger

and acting as an extension of said plunger, and including a tip extendable below said lower end of said mounting means to



engage the end of the shank of an end plug of a fuel rod in said upper tie plate.

4,420,456

MOUNTING OF POWER CONDUCTOR AND INSTRUMENT LEAD PENETRATIONS FOR NUCLEAR REACTOR INSTALLATIONS

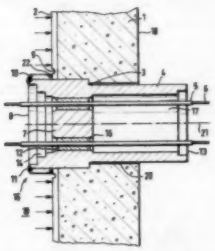
Walter Nickel, Viernheim; Josef Schoening, Hambruecken, and Hans-Georg Schwiers, Ketsch, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

Filed Apr. 23, 1981, Ser. No. 256,973

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1980, 3015494

Int. Cl.³ G21C *17/00*

U.S. Cl. 376—245 **15 Claims**



1. A mounting construction for power conductors and instrument leads passing through a wall of a nuclear reactor pressure vessel comprising:

a cylindrical metal housing having a first outer circumference larger than a second outer circumference and a shoulder area between said first and second circumferences, said cylindrical metal housing being tightly fitted along its length and outer circumference in a passageway in said nuclear reactor pressure vessel wall, and terminating with a part of said first outer circumference inside said pressure vessel;

a metal, cylindrical tube segment tightly surrounding said part of the first outer circumference within said pressure vessel and fixedly attached thereto with a lip weld;

at least one electrical conductor extending through the length of said cylindrical metal housing, and

solid filler material at least partially filling the space within said cylindrical metal housing.

4,420,457

FUEL ASSEMBLY

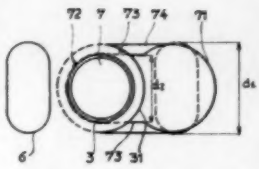
Jacques Le Pargneux, Lyon, France, assignor to Framatome, Courbevoie, France

Filed Sep. 18, 1981, Ser. No. 303,673

Claims priority, application France, Oct. 8, 1980, 80 21499

Int. Cl.³ G21C *3/32*

U.S. Cl. 376—446 **5 Claims**



1. A fuel assembly for a nuclear reactor, including

a plurality of fuel elements arranged vertically in a supporting frame including two endpieces, the upper **1** and lower **2** respectively, to which are attached the ends of a plurality of vertical tubes **3** along which are arranged a plurality of grids **4** for retaining the fuel elements **5**, each endpiece **1(2)** comprising a plane base **11 (21)** upon which are arranged a first series of orifices **7** in which the ends of the tubes **3** are engaged and fixed and a second series of orifices **6** for the flow of fluid for cooling the fuel elements **5**, characterized by the fact that the base **11 (21)** of each endpiece **1 (2)** is associated with an inner plate **15 (25)** equipped with the same series of orifices **70** for engagement of the tubes **3** and **60** for the flow of fluid, the said inner plate **15 (25)** being joined side by side with the said base **1 (2)** and connected to it by detachable means **18 (26)** of attachment so as to form a whole having the mechanical characteristics demanded of the base **1 (2)**, and by the fact that the orifices **70** for engagement of the tubes **3**, arranged in the inner plate **18 (25)**, have an oblong cross-section and are equipment with parts **74** for attachment, which cooperate with corresponding parts **31** arranged on the end of each tube **3** for the attachment of these tubes by transverse displacement of the inner plate, the whole being then locked by attachment of the base to the inner plate.

4,420,458

NUCLEAR FUEL ASSEMBLY WITH COOLANT CONDUCTING TUBE

Thomas G. Dunlap; William G. Jameson, Jr., both of San Jose; Carl R. Mefford, Los Gatos; Harold L. Nelson, and James E. Cearley, both of San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

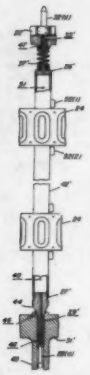
Filed Apr. 29, 1981, Ser. No. 258,639

Int. Cl.³ G21C *3/32*

U.S. Cl. 376—447 **10 Claims**

1. A nuclear fuel assembly comprising: a plurality of nuclear fuel rods each fitted with an upper end plug and a lower end plug with axially extending shanks; support means providing a plurality of support positions for retaining said fuel rods in spaced array, said support means including a lower tie plate including a support grid formed with support cavities for receiving the lower end plug shanks of said fuel rods and an upper tie plate formed with support cavities for receiving the upper end plug shanks of said fuel rods, said lower tie plate further including a nose piece extending from said support grid

and forming a coolant receiving chamber; a moderator containing tube in one of said support positions, said tube being fitted with an upper end plug with an axially extending upper end plug shank engaging a support cavity in said upper tie plate and a lower end plug with an axially extending lower end plug shank engaging a support cavity in said support grid of said lower tie plate, said upper end plug shank being elongated and extending substantially above the upper surface of said upper tie plate; a plurality of axially spaced spacers for laterally supporting said fuel rods and said tube; spacer retaining means fixed to said tube for engaging said spacers to prevent substantial axial displacement thereof, said lower end plug shanks of said tube and its mating support cavity in said support grid of



said lower tie plate being formed with a transverse cross section shape which prevents rotation of said tube to prevent disengagement of said spacer retaining means from said spacers, said lower end plug shank of said tube being elongated and having a length greater than the length of the lower end plug shanks of said fuel rods whereby it extends substantially below the lower surface of said support grid of said lower tie plate into said coolant receiving chamber, said mating support cavity for the elongated lower end plug shank of said tube being formed with a boss extended downward into said chamber and surrounding said elongated lower end plug shank of said tube to protect it from coolant flow in said chamber whereby flow induced vibration of said elongated lower end plug shank is prevented.

4,420,459

METHOD OF MAKING PREFORMS FOR BRAZING AND HARDFACING

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 198,684, Oct. 20, 1980, abandoned. This application Jan. 15, 1982, Ser. No. 339,358

Int. Cl.³ B22F *1/00*

U.S. Cl. 419—61 **9 Claims**

1. A method suitable for manufacturing flat brittle metal alloy brazing preforms comprising:

(a) forming a powder of a predetermined particle size, said powder being said brittle metal alloy,

(b) mixing said powder with a volatile organic vehicle to form a paste of a predetermined viscosity,

(c) covering a screen having opening between the strands thereof with a light sensitive coating to fill the opening between said strands with said light sensitive coating,

(d) masking said screen with a sheet having an image of a desired preform pattern,

(e) exposing said coating with light through said sheet to sensitize said coating with said image,

(f) etching the coating to remove said sensitized areas to define an opening in said coating, said opening having said preform pattern,

(g) placing a substrate on one side of said screen,

(h) forcing a predetermined amount of said paste through said opening from the opposing side of said screen to form a deposit upon said substrate, said deposit being a green preform relatively uniform in thickness, and

(i) heating said green preform to remove said organic vehicle to form said flat, brittle metal alloy.

4,420,460

GRAIN REFINEMENT OF TITANIUM ALLOYS

Frank A. Crossley, Palo Alto, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Dec. 2, 1982, Ser. No. 446,331

Int. Cl.³ C22C *14/00*

U.S. Cl. 420—417 **7 Claims**

1. A method for the grain refinement of cast titanium alloys containing at least 70 weight percent titanium comprising inoculating said molten alloys prior to or during casting thereof with at least one material which is not completely dissolved in said alloys and which is selected from the group of materials consisting of titanium and 0.4 to 15 weight percent carbon, titanium and 1.4 to 6 weight percent nitrogen and titanium and 1.3 to 10 weight percent oxygen, said material being added to titanium alloys in amounts of about 0.5 to about 1 milligram of inoculant per pound of alloy when the average inoculant particle size is about one micrometer.

4,420,461

AGGLUTINATION-INHIBITION TEST KIT FOR DETECTING IMMUNE COMPLEXES

Rudolph P. Reckel, Bridgewater, and Joanne L. Harris, Annandale, both of N.J., assignors to Ortho Diagnostic Systems Inc., Raritan, N.J.

Filed May 26, 1982, Ser. No. 382,261

Int. Cl.³ G01N *33/54*

U.S. Cl. 422—61 **4 Claims**

1. A kit for detecting immune complexes in a biological fluid, said immune complexes having endogenously bound Clq comprising:

(a) human erythrocytes coated with purified Clq; and

(b) rabbit anti-human Clq immunoglobulin.

4,420,462

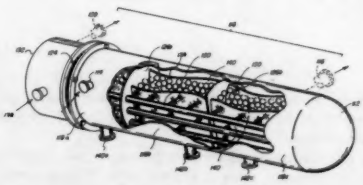
CATALYTIC HEAT EXCHANGER

Robert A. Clyde, P.O. Box 983, Asheville, N.C. 28802

Filed Mar. 22, 1982, Ser. No. 360,605

Int. Cl.³ F28D *7/06*

U.S. Cl. 422—201 **13 Claims**



1. A catalytic heat exchanger useful for carrying out a catalytic reaction wherein a gaseous or vaporized mixture is flowed into contact with catalytic material reactive with such mixture, said catalytic heat exchanger comprising:

(a) a hollow container defining a reaction zone for the gaseous or vaporized mixture and the catalytic material;

(b) an inlet conduit and an outlet conduit for the gaseous or

vaporized mixture respectively located at opposite ends of said reaction zone;

(c) baffle means disposed within said reaction zone transversed to the flow of the gaseous or vaporized mixture, said baffle means occupying a substantial but incomplete cross-section of said reaction zone available for the flow of the gaseous or vaporized mixture so as to form a tortuous flow path for the gaseous or vaporized mixture and to divide said reaction zone into at least first and second regions having first and second transverse volumes, respectively, which vary as a function of the distance from said inlet conduit;

(d) means for supporting catalytic material within said first and second regions of said reaction zone; and

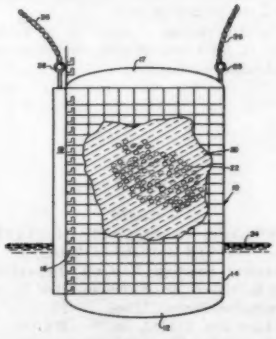
(e) heat exchange means disposed within said first and second regions of said reaction zone and adapted to circulate a heat exchange fluid therethrough in a manner such that a gaseous or vaporized mixture flowing through said reaction zone sequentially (1) flows across said heat exchange means, (2) flows through the catalytic material located in said first region, (3) flows around said baffle means, (4) flows across said heat exchange means, and (5) flows through the catalytic material located in said second region.

4,420,463

DRY CHEMICAL FEED SYSTEM

Frances C. Pocius, Lombard, and William T. Buchanan, Oak Brook, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 22, 1982, Ser. No. 350,508
Int. Cl.³ B01D *11/02*
U.S. Cl. 422—266 **4 Claims**



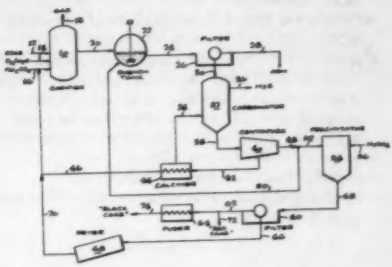
1. An apparatus for feeding slowly soluble water-souble chemicals into the basin of a cooling tower which contains water which comprises a rigid mesh cyindrical drum having a bottom, sides, and an open top, vertically, spaced-apart hooks positioned along the inside of the drum, a plastic mesh bag which contains solid, slowly soluble water-soluble chemicals affixed to one or more of said hooks, and means positioned at the top of the rigid mesh cylindrical drum for suspending it below the water level of the basin of a cooling tower.

4,420,464

RECOVERY OF VANADIUM FROM CARBONACEOUS MATERIALS

Kenneth M. Barclay, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 26, 1981, Ser. No. 314,611
Int. Cl.³ C22B *34/22*; C01G *31/00, 31/02*
U.S. Cl. 423—65 **19 Claims**



1. A process for recovering vanadium values from a carbonaceous material containing vanadium which comprises:

treating said carbonaceous material with an oxygen-containing gas in a molten salt comprising an alkali metal carbonate to convert the vanadium present in said carbonaceous material into water-soluble vanadium compounds;

quenching at least a part of the melt containing said water-soluble vanadium compounds in an aqueous solution;

removing ash from the resulting quenched melt solution;

reacting the de-ashed quenched melt solution with carbon dioxide to produce alkali metal bicarbonates and hydrogen sulfide gas and to lower the alkalinity of said solution from about pH 13.0 to a pH in the range of about pH 8.0 to pH 9.5;

separating precipitated alkali metal bicarbonates from a solution containing alkali metal bicarbonates, alkali metal carbonates and water-soluble vanadium compounds;

heating the separated precipitated alkali metal bicarbonates to release carbon dioxide therefrom and to form alkali metal carbonates;

recycling the thus formed alkali metal carbonates to said molten salt;

treating said solution containing unprecipitated alkali metal bicarbonates, alkali metal carbonates and water-soluble vanadium compounds with sulfuric acid at a temperature in the range of about 75°-125° C. and a pH in the range of about pH 1.0 to pH 3.5 to form insoluble alkali metal vanadates and soluble alkali metal sulfates;

recovering said alkali metal vanadates; and

recycling said alkali metal sulfates to provide at least a part of said molten salt.

19. A process for recovering vanadium values from a carbonaceous material containing vanadium which comprises:

treating said carbonaceous material with an oxygen-containing gas in a molten salt comprising an alkali metal carbonate to convert the vanadium present in said carbonaceous material to water-soluble vanadium compounds;

quenching at least a part of the melt containing said water-soluble vanadium compounds in an aqueous solution;

treating said quenched melt solution with carbon dioxide to produce alkali metal bicarbonates and to convert a substantial proportion of the silicates present in the quenched melt to silica and to lower fhe alkalinity of said solution from about pH 13.0 to a pH in the range of about pH 9.5 to pH 10.0;

removing ash and silica from the resulting carbon dioxide-treated quenched melt solution;

stripping hydrogen sulfide from the de-ashed carbon dioxide-treated quenched melt solution;

treating the resulting stripped solution with carbon dioxide to provide a pH in the range of about pH 8.0 to pH 8.2 and to precipitate alkali metal bicarbonates;

separating precipitated alkali metal bicarbonates from a solution containing alkali metal bicarbonates, alkali metal carbonates and water-soluble vanadium compounds;

heating the separated precipitated alkali metal bicarbonates to release carbon-dioxide therefrom and to form alkali metal carbonates;

recycling the thus formed alkali metal carbonates to said molten salt;

treating said solution containing unprecipitated metal bicarbonates, alkali metal carbonates and water-soluble vanadium compounds with sulfuric acid at a temperature in the range of about 75°–125° C. at a pH in the range of about pH 1.0 to pH 3.5 to form insoluble alkali metal vanadates and soluble alkali metal sulfates;

recovering said alkali metal vanadates; and

recycling said alkali metal sulfates to provide at least a part of said molten salt.

4,420,465

PROCESS FOR DESULFURIZING AN EXHAUST GAS

Naoharu Shinoda; Atsushi Tatani; Naohiko Ukawa; Michio Oshima; Susumu Okino, and Sadaichi Shigeta, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,835

Claims priority, application Japan, Jun. 22, 1981, 56-95258

Int. Cl.³ C01B *17/00*

U.S. Cl. 423—242 **3 Claims**

1. A process for desulfurizing an exhaust gas which comprises desulfurizing an exhaust gas containing SO_2 by contacting the exhaust gas with an aqueous slurry containing calcium compounds as an absorbent and aluminum compounds, said aluminum compounds originating as impurities in the absorbent, the exhaust gas and make-up water used to prepare the slurry, wherein the concentration of dissolved aluminum ions in said slurry is determined and a manganese compound is supplied into said slurry in such a manner that the ratio of the concentration of manganese, including both solid and liquid manganese, to the concentration of the dissolved aluminum ions is in a molar ratio of at least about 0.01 in the slurry so as to improve the desulfurization of the exhaust gas.

4,420,466

PROCESS FOR PRODUCING PHOSPHORUS PENTOXIDE

Won C. Park, Irvine, and Jacob J. Mu, Santa Ana, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed May 10, 1982, Ser. No. 376,341

Int. Cl.³ C01B *25/12, 25/16, 25/01, 25/02*

U.S. Cl. 423—304 **12 Claims**

1. A process for producing phosphorus pentoxide from phosphate ore comprising the steps of:

mixing beneficiated phosphate ore with lime and solid carbonaceous material in amounts to produce a feed mixture having a CaO/SiO_2 mole ratio greater than about 8.0;

forming the feed mixture into pellets;

heating the pellets, by exposure to radiation emanating from an oxidation zone, to a temperature sufficient to reduce the phosphate in the pellets by reaction with the solid carbonaceous material to form elemental phosphorus vapors without substantial melting of the pellets; and,

providing sufficient oxygen-containing gas to cause oxidation of the elemental phosphorus vapor within the oxidation zone to produce phosphorus pentoxide and to heat the pellets.

4,420,467

ZEOLITE NU-5

Thomas V. Whittam, Darlington, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Dec. 17, 1981, Ser. No. 331,832

Claims priority, application United Kingdom, Dec. 17, 1980, 8040395

Int. Cl.³ C01B *33/20, 33/28;* **B01J** *29/04*

U.S. Cl. 423—328 **6 Claims**

1. A synthetic zeolite material having a molar composition expressed by the formula: 0.5 to $1.5R_2O:Y_2O_3$:45 to $100XO_2$:0 to $2000H_2O$ wherein R is a monovalent cation or 1/n of a cation of valency n, X is silicon or germanium, Y is aluminium, and H_2O is water of hydration additional to water notionally present when R is H, and having an X-ray diffraction pattern as set out in Table 1.

4,420,468

METHOD OF TREATING CONVERTED POTASSIUM SULFATE FOR REDUCING A SMALL AMOUNT OF CHLORINE CONTAINED THEREIN

Yoshisato Yamashita; Masanobu Inoue, both of Minamatashi, and Kohichi Fukatsu, Yachiyoshi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Jan. 29, 1982, Ser. No. 344,011

Claims priority, application Japan, Jun. 15, 1981, 56-92015

Int. Cl.³ C01B *7/01;* **C01D** *15/06*

U.S. Cl. 423—482 **15 Claims**

1. A method for the recovery of converted potassium sulfate having a low chlorine content comprising:

providing a potassium sulfate mixture prepared by mixing and heating potassium chloride with one of sulfuric acid and potassium hydrogen sulfate, said mixture comprising hydrogen sulfate, chlorine and sulfuric acid;

screening the mixture with a 60-mesh Tyler screen;

recovering the portion of the mixture passing through the 60-mesh Tyler screen as a portion having a low chlorine content;

pulverizing the portion of the mixture remaining on the 60-mesh Tyler screening; and

calcining the pulverized mixture at a temperature of 300°–500° C. for a time of five minutes to one hour to reduce the chlorine content.

4,420,469

PYROHYDROLYSIS OF COLUMBIUM OXYFLUORIDE TO COLUMBIUM OXIDE

Roger M. Bergman, Sanatoga; Edwin J. Bielecki, Boyertown, and Charles R. Nippert, Jr., Pottstown, all of Pa., assignors to Cabot Corporation, Boston, Mass.

Filed Jun. 1, 1982, Ser. No. 384,077

Int. Cl.³ C01G *33/00*

U.S. Cl. 423—592 **7 Claims**

1. A process for the production of columbium oxide comprising: pyrohydrolyzing a columbium oxyfluoride material by heating it at a temperature ranging from at least about 600° C. to about 1200° C. in the presence of a flowing water vapor atmosphere containing at least about two percent by volume water introduced at a rate sufficient to provide at least about 0.5 mole of water per mole of said columbium oxyfluoride reactant during the time of reaction of CbO_2F to form $CbOF_3$.

4,420,470

PERCUTANEOUS ABSORPTION TYPE PHARMACEUTICAL PREPARATION OF ISOSORBIDE DINITRATE OR PENTAERYTHRITOL TETRANITRATE IN PRESSURE-SENSITIVE LAMINATE

Saburo Otsuka; Toshiyuki Yoshikawa; Shoichi Tokuda, and Yuuseke Ito, all of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka and Toa Eiyo Ltd., Tokyo, both of, Japan

Filed Jan. 8, 1982, Ser. No. 338,190
Claims priority, application Japan, Jan. 8, 1981, 56-1805
Int. Cl.[3] A61L *15/03;* A61F *13/00;* A61K *9/70*
U.S. Cl. 424—28 11 Claims

1. A pharmaceutical preparation comprising a flexible backing and a base material formed on the flexible backing, said base material comprising a layer of a polymer having a glass transition temperature (Tg) of from −70° C. to −10° C. and exhibiting pressure-sensitivity at room temperature, and isosorbide dinitrate (ISDN) or pentaerythritol tetranitrate (PETN) retained in said base material, wherein the polymer contains at least 50% by weight alkyl acrylate or methacrylate containing an average of at least 4 carbon atoms in the alkyl moiety, wherein the isosorbide dinitrate or pentaerythritol tetranitrate concentration in the base material is from 0.5 to 20% by weight and wherein the laminate is composed of a polyester and a member selected from an ethylene-vinylacetate copolymer and an ethylene-ethylacrylate copolymer which prevents the crystallization of the isosorbide dinitrate or pentaerythritol tetranitrate.

4,420,471

CITRUS FLAVORED MOUTHWASH FORMULATION METHOD

Craig T. Elton, Rochelle Park, N.J., and Stephen Reynolds, Maybrook, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 10, 1983, Ser. No. 457,093
Int. Cl.[3] A61K *7/16, 7/26*
U.S. Cl. 424—49 12 Claims

1. A method of formulating a liquid mouthwash comprising from about 0.01 to about 0.5% of citrus flavor oil, about 0.1 to about 2.0% emulsifier, about 1% to about 25% C_{2-3} alcohol and about 60 to about 95% part water, including the steps of:
(a) preparing a blend of the alcohol with the citrus flavor oil;
(b) preparing a second blend of water and the emulsifier;
(c) subsequently combining blends (a) and (b); and
(d) intimately mixing the resultant combination.

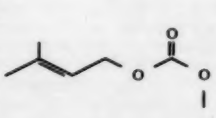
4,420,472

PRENYL METHYL CARBONATE AND ORGANOLEPTIC USES THEREOF

Richard M. Boden, Ocean; Manfred H. Vock, Locust, and Theodore J. Tyszkiewicz, Sayreville, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,947
Int. Cl.[3] A61K *7/16, 7/26;* C07C *69/96;* C11B *9/00*
U.S. Cl. 424—58 4 Claims

1. Prenyl methyl carbonate defined according to the structure:



4,420,473

ANTIBIOTIC, MF266 SUBSTANCE AND PRODUCTION THEREOF

Hamao Umezawa; Tomio Takeuchi; Masa Hamada, all of Tokyo; Shinichi Kondo, Yokohama, and Kiyoto Ishii, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Aug. 27, 1981, Ser. No. 296,923
Claims priority, application Japan, Sep. 12, 1980, 55-126087
Int. Cl.[3] A61K *35/00;* C12P *1/06*
U.S. Cl. 424—118 5 Claims

1. The MF266 substance which is a red colored amphoteric compound and of which the hydrochloride decomposes at 178°–180° C. and shows a specific optical rotation $[\alpha]_D^{25} = +370°$ (c 0.1, methanol) and an elemental analysis: C 49.00%, H 6.56%, N 3.39%, O 28.58%, Cl 7.17%, the infrared absorption spectrum of the MF266 substance hydrochloride pelleted in potassium bromide giving main absorption peaks as shown in FIG. 1 of the attached drawings, and the ultraviolet absorption spectra of the MF266 substance hydrochloride giving absorption maxima at 220, 235, 254, 290, 380, 475, 496, 535 and 575 nm with $E_{1\,cm}^{1\%}$ values of 208, 276, 232, 64, 28, 96, 100, 64 and 14, respectively when determined in methanol; absorption maxima at 220 (shoulder), 235, 254, 290, 380, 480, 497, 535 and 570 nm with $E_{1\,cm}^{1\%}$ values of 188, 264, 241, 64, 28, 92, 100, 60 and 14, respectively when determined in 0.1 N hydrogen chloride in 90% aqueous methanol; and absorption maxima at 213, 253, 292, 360, 560 and 597 nm with $E_{1\,cm}^{1\%}$ values of 688, 247, 48, 36, 100 and 100, respectively when determined in solution in 0.1 N aqueous sodium hydroxide in 90% aqueous methanol as shown in FIG. 2 of the attached drawings, the MF266 substance hydrochloride being further characterized by that it is soluble in water, methanol, dimethylsulfoxide and pyridine but sparingly soluble in chloroform, acetone, benzene and ethyl acetate and that it gives a single spot at Rf 0.27 in a thin layer chromatography on silica gel developed with chloroform-methanol-10% aqueous ammonium acetate (20:15:1 by volume) and a single spot at Rf 0.06 in the same silica gel thin layer chromatography developed with chloroform-methanol (1:1 by volume) and a single spot at Rf 0.10 in the same silica gel thin layer chromatography developed with chloroform-methanol-acetic acid (20:5:1 by volume) as eluent.

4,420,474

SYNERGISTIC ANTIFUNGAL COMPOSITIONS

Richard B. Sykes, Rocky Hill, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 15, 1979, Ser. No. 85,161
Int. Cl.[3] A61K *35/00, 31/415*
U.S. Cl. 424—121 1 Claim

1. A composition for the treatment of a fungal infection comprising a combination of azalomycin F and econazole, wherein the weight ratio of azalomycin F to econazole is from about 8:1 to 1:4.

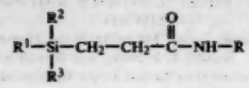
4,420,475

SILICON-BEARING AMIDES

Robert E. Damon, II, Randolph, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

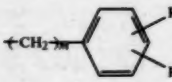
Continuation-in-part of Ser. No. 80,424, Oct. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 74,002, Sep. 10, 1979, abandoned. This application Dec. 11, 1980, Ser. No. 215,414
Int. Cl.[3] C07F *7/10;* A01N *55/00;* A61K *31/695*
U.S. Cl. 424—184 32 Claims

1. A compound of the formula:



wherein each of

R^1, R^2 and R^3 is, independently, alkyl having from 1 to 22 carbon atoms; or a radical of the formula

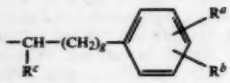


in which

m is 0, 1 or 2, and each of R′ and R″ is independently a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 127; and

R is a an aralkyl-type radical of the formula (a), (c) or (d)

(a)



wherein

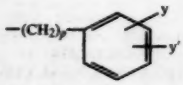
g is 0, 1 or 2;

R^a is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms, or trifluoromethyl;

R^b is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; and

R^c is subtype (i) a hydrogen atom; subtype (ii), a radical of the structure

(ii)



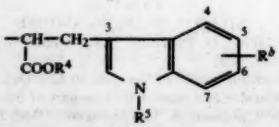
in which

p is 0, 1 or 2, and

y is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; and

y′ is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; or subtype (iii) alkyl having from 1 to 8 carbon atoms; or

(c)



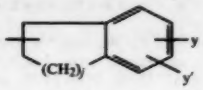
wherein

R^b is as defined above;

R^4 is hydrogen; an equivalent of a cation which results in the formation of a salt which is pharmaceutically acceptable; alkyl having from 1 to 8 carbon atoms; or benzyl;

R^5 is a hydrogen atom, alkyl having from 1 to 8 carbon atoms or benzyl; or

(d)

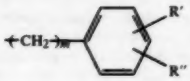


wherein

y and y′ are as defined above; and

j is a whole integer of from 1 to 4;

providing that at least one of R^1, R^2 and R^3 is of the formula



4,420,476

BENZOFURO[3,2-C]PYRAZOL-3-AMINE DERIVATIVES

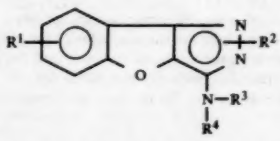
Adolf Philipp, St. Laurent; Ivo Jirkovsky, Montreal, and Rene Martel, Candiac, all of Canada, assignors to Averst McKenna & Harrison, Inc., Montreal, Canada

Filed May 24, 1982, Ser. No. 380,973

Int. Cl.[3] **A61K** *31/62, 31/485, 31/415, 31/44;* **C07D** *491/44*

U.S. Cl. 424—232 **30 Claims**

1. A compound of the formula



in which R^1 is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy or trifluoromethyl; R^2 represents one lower alkyl substituent on either of the adjacent nitrogen atoms; R^3 is hydrogen, lower alkyl, trihalomethyl(lower)alkyl; oxo(lower alkyl); lower alkanoyl; 2-, 3- or 4-pyridinyl(lower)alkyl; lower alkylaminocarbonyl or lower alkylaminothiocarbonyl; and R^4 is hydrogen or lower alkyl; or a therapeutically acceptable acid addition salt thereof.

28. A method of producing analgesia in a mammal, which comprises administering to the mammal an effective analgesic amount of a compound of claim **1**, or a therapeutically acceptable acid addition salt thereof.

29. A method of producing analgesia in a mammal, which comprises administering to the mammal an effective analgesic amount of a compound of claim **1**, or a therapeutically acceptable acid addition salt thereof, in combination with an effective amount of another analgesic agen: selected from acetylsalicyclic acid, acetaminophen, aminopyrine, etodolac, codeine or morphine.

4,420,477

CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Yoshikazu Inoue, Amagasaki; Nobuyoshi Yasuda, and Masayoshi Murata, both of Mino, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

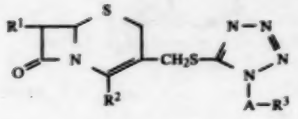
Filed Nov. 24, 1980, Ser. No. 209,988

Claims priority, application United Kingdom, Nov. 30, 1979, 7941417

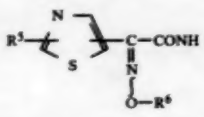
Int. Cl.³ C07D 501/36; A61K 31/545

U.S. Cl. 424—246 23 Claims

1. A cephem compound of the formula:



wherein R^1 is a group of the formula:



in which R^5 is amino or a protected amino group; and R^6 is lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl, cyclo(lower)alkenyl, aryl, ar(lower)alkyl, or halogen-substituted ar(lower)alkyl;

R^2 is carboxy or a protected carboxy group;

A is hydroxy(lower)alkylene, amino(lower) alkylene, protected amino(lower)alkylene, lower alkenylene, hydroxyimino(lower)alkylene, lower alkoxyimino(lower) alkylene, or lower alkenyloxyimino(lower) alkylene; and

R^3 is carboxy or a protected carboxy group, and pharmaceutically acceptable salts thereof.

4,420,478

NOVEL OXIMES

Rene Heymes, Romainville, and Andre Lutz, Strasbourg, both of France, assignors to Roussel Uclaf, Paris, France

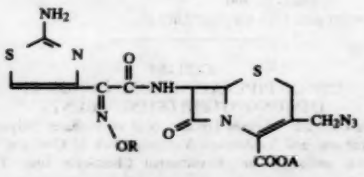
Filed Apr. 9, 1979, Ser. No. 28,372

Claims priority, application France, Apr. 14, 1978, 78 11065; Oct. 5, 1978, 78 28465

Int. Cl.³ A61K 31/545; C07D 501/46

U.S. Cl. 424—246 24 Claims

1. A compound selected from the group consisting of syn isomers of oximes of 3-azidomethyl-7-aminothiazolyl-cephalosporanic acids of the formula



wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl and alkynyl of 2 to 4 carbon atoms, benzoyl and $—(CH_2)_n—R_1$, n is an integer from 1 to 4, R_1 is selected from the group consisting of NH_2 and —COOA′ and A′ and A are selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, $—NH_4$, an easily cleavable ester group selected from the group consisting of methoxymethyl, α-methoxyethyl, ethoxymethyl, isopropyloxymethyl, α-ethoxyethyl, methylthiomethyl, ethylthiomethyl, isopropylthiomethyl, pivaloyloxymethyl, acetoxymethyl, propionyloxymethyl, isobutyryloxymethyl, isovaleryloxymethyl, isovaleryloxyethyl, propionyloxyethyl 1-acetoxyethyl, 1-acetoxypropyl, 1-acetoxybutyl, 1-acetoxyhexyl and 1-acetoxyheptyl and a non-toxic, pharmaceutically acceptable organic amine and their non-toxic, pharmaceutically acceptable acid addition salts.

9. An antibiotic composition comprising an antibiotically effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

4,420,479

OLEFINIC BENZIMIDAZOLES, FORMULATIONS, AND ANTIVIRAL METHODS

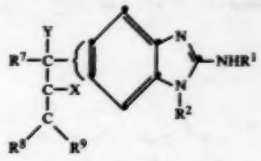
Tina M. Morwick; Charles J. Paget, both of Indianapolis, and James H. Wikel, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 8, 1982, Ser. No. 366,760

Int. Cl.³ A61K 31/415; C07D 235/30

U.S. Cl. 424—246 46 Claims

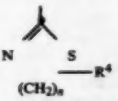
1. A compound of the formula



wherein:

R^1 is hydrogen or C_1–C_4 alkanoyl;

R^2 is hydrogen, $—SO_2R^3$ or a group of the formula



in which:

R^3 is C_1–C_5 alkyl, C_3–C_7 cycloalkyl, phenyl, furyl, thienyl, or R^5R^6N, wherein R^5 and R^6 independently are C_1–C_3 alkyl, or taken together with the nitrogen to which they are attached are pyrrolidino, piperidino or morpholino;

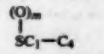
R^4 is hydrogen, C_1–C_3 alkyl, phenyl, or benzyl; and

n is 2 or 3;

R^7 is hydrogen, C_1–C_7 alkyl, C_3–C_7 cycloalkyl, (C_3–C_7 cycloalkyl)methyl, 1-(C_3–C_7 cycloalkyl)ethyl, phenyl, or phenyl substituted with one group selected from hydroxy, halo, C_1–C_4 alkoxy, nitro or trifluoromethyl;

X is hydrogen and Y is hydroxy, or together X and Y form a bond;

R^8 and R^9 independently are hydrogen, halo, cyano, nitro,



alkyl, CH_2R^{10}, COR^{10}, phenyl, or phenyl substituted with one group selected from hydroxy, halo, C_1–C_4 alkoxy, nitro or trifluoromethyl;

m is 0, 1 or 2;

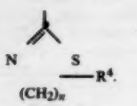
R^{10} is hydroxy, C_1–C_4 alkoxy, C_1–C_4 alkanoyloxy, halo, C_3–C_6 cycloalkyl-C_1–C_4 alkoxy, or (O—C_1–C_4 alkyl-)$_y$$NR^{11}R^{12}$ where y is 0 or 1, and

R^{11} and R^{12} independently are hydrogen or C_1–C_4 alkyl;

provided that one and only one of R^8 and R^9 is hydrogen,

except when either of R^8 or R^9 is halo, the other may be halo, and when Y is hydroxy, R^8 and R^9 are other than halo; and the pharmaceutically acceptable acid addition salts thereof.

38. The method according to claim 34 employing a compound wherein R^2 is



4,420,480

HEXAHYDRONAPHTH[1,2-b]-1,4-OXAZINES

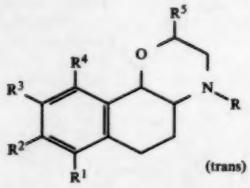
James H. Jones, Blue Bell, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 323,349, Nov. 20, 1981, abandoned. This application Aug. 30, 1982, Ser. No. 412,748

Int. Cl.[3] A61K *31/335*; C07D *498/00*

U.S. Cl. 424—248.4 32 Claims

1. A compound of structural formula:



(trans)

with positive, negative or zero optical activity, wherein:

R is

(a) hydrogen,

(b) C_{1-4} alkyl,

(c) C_{2-5} alkenyl,

(d) phenyl-C_{1-4} alkyl; and

R^1, R^2, R^3 and R^4 are independently:

(a) hydrogen,

(b) C_{1-4} alkyl,

(c) halo,

(d) OR^6 wherein R^6 is

(1) hydrogen

(2) C_{1-3} alkyl,

(3) phenyl-C_{1-3}alkyl,

wherein R^7 is

(i) C_{1-6} alkyl

(ii) C_{3-6} cycloalkyl,

(iii) phenyl-C_{1-3} alkyl, wherein the phenyl group is unsubstituted or substituted with one or more of halo, C_{1-3} alkyl or C_{1-3} alkoxy,

(iv) pyridyl-C_{1-3} alkyl,

(v) furyl-C_{1-3} alkyl,

(vi) phenyl, either unsubstituted or substituted with one or more of halo, C_{1-3} alkyl or C_{1-3} alkoxy,

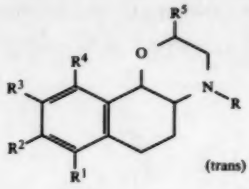
(vii) pyridyl,

(viii) furyl,

(ix) $-NR^8R^9$ wherein R^8 and R^9 are independently hydrogen or C_{1-3} alkyl, or R^8 and R^9 are joined together to form a heterocycle selected from piperidinyl, morpholinyl, piperazinyl and N-C_{1-3} alkyl-piperazinyl; and

R^5 is hydrogen, C_{1-3} alkyl or phenyl.

8. A pharmaceutical formulation for the treatment of Parkinsonism or hypertension comprising a pharmaceutical carrier and an effective amount of a compound of structural formula:



(trans)

with positive or zero optical activity, or a pharmaceutically acceptable salt thereof, wherein:

R is

(a) hydrogen,

(b) C_{1-4} alkyl,

(c) C_{2-5} alkenyl,

(d) phenyl-C_{1-4} alkyl; and

R^1, R^2, R^3 and R^4 are independently:

(a) hydrogen,

(b) C_{1-4} alkyl,

(c) halo,

(d) OR^6 wherein R^6 is

(1) hydrogen

(2) C_{1-3} alkyl,

(3) phenyl-C_{1-3}alkyl,

wherein R^7 is

(i) C_{1-6} alkyl

(ii) C_{3-6} cycloalkyl,

(iii) phenyl-C_{1-3} alkyl, wherein the phenyl group is unsubstituted or substituted with one or more of halo, C_{1-3} alkyl or C_{1-3} alkoxy,

(iv) pyridyl-C_{1-3} alkyl,

(v) furyl-C_{1-3} alkyl,

(vi) phenyl, either unsubstituted or substituted with one or more of halo, C_{1-3} alkyl or C_{1-3} alkoxy,

(vii) pyridyl,

(viii) furyl,

(ix) $-NR^8R^9$ wherein R^8 and R^9 are independently hydrogen or C_{1-3} alkyl, or R^8 and R^9 are joined together to form a heterocycle selected from piperidinyl, morpholinyl, piperazinyl and N-C_{1-3} alkyl-piperazinyl; and

R^5 is hydrogen, C_{1-3} alkyl or phenyl.

4,420,481

USE OF PIPERAZINE COMPOUNDS AS IMMUNOPOTENTIATING AGENTS

Yutaka Okazaki; Hiroshi Tokuda, both of Mobara; Shiyoichiro Miyahara, and Yoshitsugu Yamada, both of Oomuta, all of Japan, assignors to Mitsuitoatsu Chemicals Inc., Tokyo, Japan

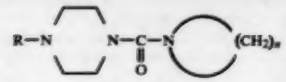
Filed Feb. 19, 1981, Ser. No. 235,992

Claims priority, application Japan, Feb. 15, 1980, 55-016560

Int. Cl.[3] C07D *403/00, 401/00*; A61K *31/495*

U.S. Cl. 424—250 2 Claims

1. A method for the treatment of chronic rheumatoid arthritis, comprising administering, to a patient having chronic rheumatoid arthritis, an immunopotentiating amount of a piperazine compound represented by the following formula (I):



wherein R is a C_{1-4} alkyl group or a phenyl group and n is 4 or 5,

in the form of a free base or a biologically acceptable acid addition salt.

4,420,482

1,4-BIS(ACETYLSALICYLOYLOXY)PIPERIZINE DERIVATIVES

Carlo Milani; Giovanni M. Carminati, and Attilio Sovera, all of Milan, Italy, assignors to Selvi & C. S.p.A., Milan, Italy

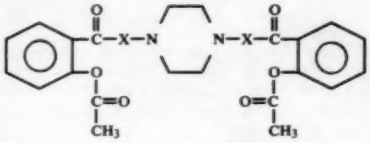
Filed Nov. 19, 1981, Ser. No. 322,855

Claims priority, application Italy, Nov. 20, 1980, 26131 A/80

Int. Cl.³ A61k *31/495;* **C07D** *295/00*

U.S. Cl. 424—250 **9 Claims**

1. A compound of the formula



wherein X represents a direct linkage between the carbon and nitrogen atoms or a linear or branched oxyalkyl group having 2–4 carbon atoms linked through its oxygen atom to the nitrogen atom, and the pharmaceutically acceptable salts thereof.

9. A pharmaceutical composition having antipyretic, analgesic, anti-inflammatory and antihistaminic activities suitable for oral, parenteral, rectal or topical administration containing, as the active ingredient, and antipyretic, analgesic, anti-inflammatory and antihistaminic effective amount of a compound according to claim **1**.

4,420,483

ANALGESIC AND ANTI-INFLAMMATORY COMPOSITIONS COMPRISING IBUPROFEN AND METHODS OF USING SAME

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Richardson-Vicks, Inc., Wilton, Conn.

Filed Jul. 22, 1982, Ser. No. 400,645

Int. Cl.³ A61K *31/19, 31/53*

U.S. Cl. 424—253 **22 Claims**

1. The method of eliciting an onset hastened and enhanced analgesic and anti-inflammatory response in a mammalian organism in need of such treatment, comprising administering to such organism a unit dosage analgesically and anti-inflammatorily effective amount of a pharmaceuticl composition of matter comprising an ibuprofen component and an ibuprofen potentiating adjuvant therefor, said adjuvant consisting essentially of ibuprofen and anti-inflammatory onset hastening and enhancing amount of caffeine.

4,420,484

BASIC AMINO OR AMMONIUM ANTIMICROBIAL AGENT-POLYETHYLENE GLYCOL ESTER SURFACTANT-BETAINE AND/OR AMINE OXIDE SURFACTANT COMPOSITIONS AND METHOD OF USE THEROF

William G. Gorman, East Greenbush, and Karl F. Popp, Schodack Landing, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 245,089, Mar. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 158,737, Jun. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 65,885, Aug. 13, 1979, abandoned. This application Nov. 12, 1981, Ser. No. 320,754

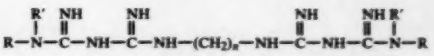
Int. Cl.³ A61K *31/55*

U.S. Cl. 424—326 **31 Claims**

1. An antimicrobial skin cleansing composition consisting essentially of

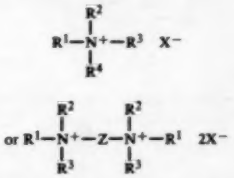
(A) an antimicrobially effective amount of one or more antimicrobial agents selected from the group consisting of

(a) a compound having the structural formula



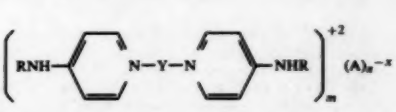
wherein R taken alone is phenyl substituted by alkyl, alkoxy, nitro or halo, p-(2,2-dichlorocyclopropyl)phenyl, alkyl having from 6 to 16 carbon atoms, cycloalkyl or polycyclic alkyl having more than 6 carbon atoms or lower-alkyl-cycloalkyl or cycloalkyl-lower-alkyl having from 1 to 4 carbons in lower alkyl; R′ taken alone is hydrogen; R and R′ taken together are 3-azabicyclo(3,2,2)monyl; and n is an integer from 3 to 9; or a pharmaceutically acceptable salt thereof;

(b) a compound having the structural formula



wherein R^1 is long-chain alkyl or aralkyl; R^2 is short-chain alkyl, long-chain alkyl or aralkyl, benzyl or part of an aromatic system or non-aromatic system; R^3 and R^4 are short-chain alkyl or part of an aromatic ring system or non-aromatic ring system; Z is a carbon-hydrogen chain; and X is a pharmaceutically acceptable anion; and

(c) a compound having the structural formula



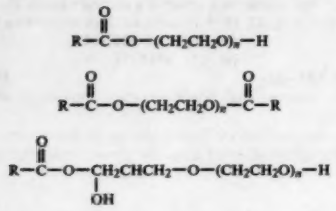
wherein

R is an alkyl group containing from 6 to 18 carbon atoms, a cycloalkyl group containing from 5 to 7 carbon atoms, benzyl, benzyl substituted by one or two substituents selected from the group consisting of halogen, hydroxy, lower-alkyl, lower-alkoxy, nitro, cyano and trifluoromethyl or phenyl substituted by methylenedioxy or one or two substituents selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, nitro, cyano and trifluoromethyl;

Y is an alkylene group containing from 4 to 18 carbon

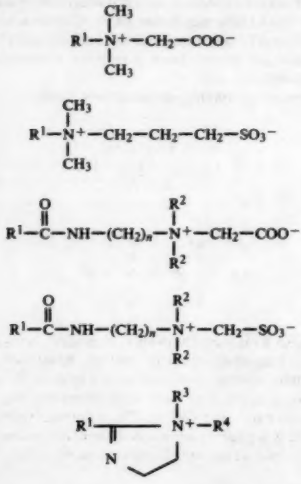
atoms and separating the two 4-(R-NH)-1-pyridinyl groups by from 4 to 18 carbon atoms;
A is a pharmaceutically acceptable anion;
m is 1 or 3;
n is 1 or 2;
x is 1, 2 or 3; and
(m)(2)=(n)(x);

(B) from about 0.75% to about 30% by weight of one or more polyethylene glycol ester surfactants having the structural formulas



wherein R is alkyl or alkenyl having from about 8 to about 20 carbon atoms or lanolin and n is an integer from about 8 to about 200;

(C) from about 0.5% to about 30% by weight of one or more surfactants selected from the group consisting of
(a) betaines having the structural formulas



wherein R^1 is alkyl or alkenyl having from about 8 to about 18 carbon atoms; R^2 is methyl, ethyl or 2-hydroxyethyl; R^3 is 2-hydroxyethyl or CH_2COO^-; R^4 is CH_2COO^- or CH_2CH_2-O-CH_2COO^-; an n is 2 or 3; and
(b) amine oxides having the structural formula

wherein R^1 taken alone is methyl, ethyl or 2-hydroxyethyl; R^2 taken alone is methyl, ethyl or 2-hydroxyethyl; R^1 and R^2 taken together are morpholino; R^3 is alkyl having from about 8 to about 18 carbon atoms or $R^4CONH(CH_2)_3$ wherein R^4 is alkyl having from about 8 to about 18 carbon atoms; and wherein 2-hydroxyethyl can be condensed with from 1 to about 200 units of ethylene oxide; and

(D) water, aqueous ethyl alcohol, aqueous isopropyl alcohol or an aqueous ethyl alcohol-isopropyl alcohol mixture.

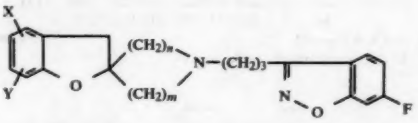
4,420,485

1'-[3-(1,2-BENZISOXAZOL-3-YL) PROPLY]SPIRO[BENZOFURAN-2(3H),3' OR 4'-PIPERIDINES OR 3'-PYRROLIDINES]

Larry Davis, Sergeantsville, and Frank A. Pierrat, Somerset, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

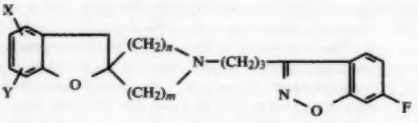
Filed Sep. 29, 1982, Ser. No. 424,379
Int. Cl.³ A61K *31/445, 31/42;* **C07D** *413/14*
U.S. Cl. 424—267 **37 Claims**

1. A compound having the formula



where X and Y are the same or different and are hydrogen, halogen, lower alkoxy, lower alkyl, nitro, hydroxyl, and CF_3; and n is an integer of 1 or 2; m is an integer of 2 or 3; and the sum of m and n is 3 or 4; and the pharmaceutically acceptable acid addition salts thereof.

27. A method of lowering the blood pressure in a mammal which comprises administering to a mammal a blood pressure reducing amount of a compound of the formula



where X and Y are the same or different and are hydrogen, halogen, lower alkoxy, lower alkyl, nitro, hydroxyl and CF_3; n is an integer of 1 or 2; m is an integer of 2 or 3; and the sum of m and n is 3 or 4; and the pharmaceutically acceptable acid addition salts thereof.

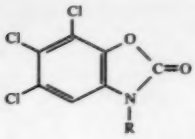
4,420,486

BENZOXAZOLONE DERIVATIVES, PROCESSES FOR PREPARATION THEREOF AND COMPOSITIONS CONTAINING THEM

Hiroshi Ohyama, Chigasaki; Kimiyoshi Kaneko, Isehara; Hiromichi Ishikawa, Atsugi; Sanae Takada, Atsugi; Ken Morita, Atsugi; Takuo Wada, Hatano; Masahiko Miyahara, and Masazumi Arakawa, both of Atsugi, all of Japan, assignors to Hokko Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jan. 22, 1981, Ser. No. 227,377
Int. Cl.³ C07D *263/58;* **A01N** *43/76*
U.S. Cl. 424—272 **9 Claims**

1. A 5,6,7-trichlorobenzoxazolone compound of the formula



wherein R is hydrogen, a (C_1–C_4) alkyl, a (C_1–C_4)alkyl-carbonyl, a chloro (C_1–C_4)alkylcarbonyl, a (C_1–C_4)alkyloxycarbonyl, a mono- or di-(C_1–C_4)alkylaminocarbonyl, a (C_1–C_4)alkylsulfonyl or phenylsulfonyl.

4,420,487

DIURETIC AND ANTIHYPERTENSIVE BENZIMIDAZOLES

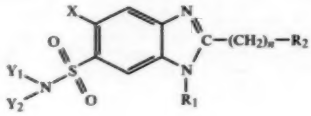
Bola V. Shetty, Stamford, Conn., and Arthur McFadden, East Brunswick, N.J., assignors to The Purdue Frederick Company, Norwalk, Conn.

Continuation-in-part of Ser. No. 895,048, Apr. 10, 1978, abandoned. This application Jun. 30, 1980, Ser. No. 164,554

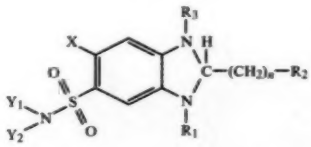
Int. Cl.[3] **A61K** *31/415*; **C07D** *235/04, 231/42, 263/50*

U.S. Cl. 424—273 B **17 Claims**

1. A compound of the formula:



or



or a physiologically compatible salt thereof, wherein:

X=halogen or trifluormethyl,

Y_1 and Y_2=independently hydrogen or lower alkyl,

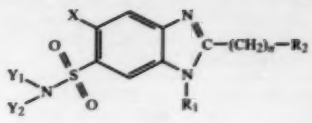
R_1=hydrogen, lower alkyl, furfuryl, phenyl substituted by lower alkyl, by lower alkoxy or by halogen,

n=0 or an integer from 1–4,

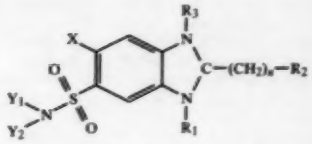
R_2=amino, hydrogen, hydroxyl, mercapto, lower alkyl mercapto, furyl, adamantanyl, halogen, lower alkyl, phenyl, phenyl substituted by lower alkyl, phenyl substituted by halogen, biphenyl, formamido, guanidino, guanidino substituted by lower alkyl and amino substituted by lower alkyl, by carboxy, by carboxy-lower alkyl, by lower alkyl-carboxy, by phenyl, by phenyl substituted by carboxy, by phenyl substituted by hydroxy, by phenyl substituted by lower alkyl, by phenyl substituted by halogen, by furfuryl, and by carboxy substituted by phenoxy lower alkyl, and

R_3=hydrogen, lower alkyl, phenyl or substituted phenyl substituted by lower alkyl, lower alkoxy or halogen.

16. The method of achieving a diuretic effect, which comprises administering to a subject requiring the same a diuretic effective amount of a compound of the formula:



or



or a physiologically compatible salt thereof, wherein:

X=halogen or trifluormethyl,

Y_1 and Y_2=independently hydrogen or lower alkyl,

R_1=hydrogen, lower alkyl, furfuryl, phenyl substituted by lower alkyl, by lower alkoxy or by halogen,

n=0 or an integer from 1–4,

R_2=amino, hydrogen, hydroxyl, mercapto, lower alkyl mercapto, furyl, adamantanyl, halogen, lower alkyl, phenyl, phenyl substituted by lower alkyl, phenyl substituted by halogen, biphenyl, formamido, guanidino, guanidino substituted by lower alkyl and amino substituted by lower alkyl, by carboxy, by carboxy-lower alkyl, by lower alkyl-carboxy, by phenyl, by phenyl substituted by carboxy, by phenyl substituted by hydroxy, by phenyl substituted by lower alkyl, by phenyl substituted by halogen, by furfuryl, and by carboxy substituted by phenoxy lower alkyl, and

R_3=hydrogen, lower alkyl, phenyl or substituted phenyl, substituted by lower alkyl, lower alkoxy or halogen.

4,420,488

QUATERNARY 1,1-DIPHENYL-4-PYRROLIDINIUM-2-BUTYNE SALTS, A PROCESS FOR THEIR PRODUCTION AND MEDICAMENTS CONTAINING THESE COMPOUNDS

Walter Liebenow, and Hans Liedtke, both of Nuremberg, Fed. Rep. of Germany, assignors to Ludwig Heumann & Co. GmbH, Nuremberg, Fed. Rep. of Germany

Filed Mar. 13, 1981, Ser. No. 243,618

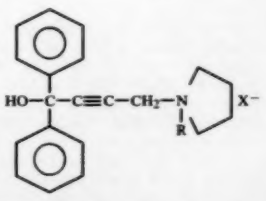
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1980, 3010152

Int. Cl.[3] **A61K** *31/40*; **C07D** *207/04*

U.S. Cl. 424—274 **3 Claims**

1. A method of treating a warm-blooded mammal, comprising administering to a warm-blooded mammal an anti-ulcerogenically effective amount of a quaternary 1,1-diphenyl-4-pyrrolidinium-2-butyne salt of the formula:

(I)



in which R represents methyl or ethyl and X is a chlorine or bromine atom, to elicit an anti-ulcerogenic response.

4,420,489

SUGARS WITH SULFUR REPLACING THE RING OXYGEN ATOM AS ANTIRADIATION AGENTS

Roy L. Whistler, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 180,304, Aug. 22, 1980, abandoned. This application Oct. 7, 1981, Ser. No. 309,280

Int. Cl.³ A61K *31/38*

U.S. Cl. 424—275 7 Claims

1. A method of treatment of an animal utilizing a ring sugar with sulfur replacing a ring oxygen atom, said method comprising the step of treating said animal with a sulfur sugar that does not adversely affect the cellular metabolism of the animal and which is transportable into the animal's cells prior to exposure of the animal to electromagnetic radiation, with the dosage of said sulfur sugar utilized to treat said animal being in an effective amount of minimize the effect of electromagnetic radiation-induced free radicals on the animal's cells.

7. A method of treatment of an animal to minimize the effect of free radicals on the animal's tissue, the treatment method comprising the steps of determining the identity of a ring sugar having a ring oxygen atom replaced by a sulfur atom which is transportable through the animal's gastrointestinal tract to the animal's cardiovascular system and is absorbed from the animal's cardiovascular system into the animal's cells, said ring sugar being selected from the group consisting of 6-thio-D-fructose, 5-thio-D-galactose, 5-thio-2-deoxyribose, and 5-thio-D-ribose and mixtures thereof, and causing the animal to ingest said ring sugar in a dosage of between about 10 mg/kg and 500 mg/kg.

4,420,490

SUBSTITUTED PHENYLACETIC ACID AMIDE COMPOUNDS

Alfred Sallmann, Bottmingen, and Gerhard Baschang, Bettingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

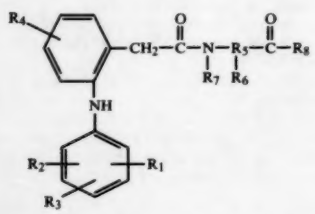
Division of Ser. No. 33,295, Apr. 25, 1979, Pat. No. 4,250,192, which is a continuation of Ser. No. 905,087, May 11, 1978, abandoned, and Ser. No. 906,292, May 15, 1978, abandoned. This application Dec. 17, 1980, Ser. No. 217,368

Claims priority, application Luxembourg, May 11, 1977, 77316; Sep. 4, 1977, 78106

Int. Cl.³ A61K *31/24*; C07C *101/44*

U.S. Cl. 424—309 7 Claims

1. A phenylacetic acid amide compound of the formula



(I)

in which R_1 is hydrogen, lower alkyl, lower alkoxy, halogen having an atomic number of not more than 35 or trifluoromethyl, R_2 is hydrogen, lower alkyl, lower alkoxy, halogen having an atomic number of not more than 35 or trifluoromethyl, R_3 is hydrogen, lower alkyl, lower alkoxy or halogen having an atomic number of not more than 35 and R_4 is hydrogen, lower alkyl, lower alkoxy or halogen having an atomic number of not more than 35, R_5 is lower alkylene or lower alkylidene, R_6 is phenyl which is unsubstituted or substituted by lower alkyl, lower alkoxy, hydroxy and/or halogen, R_7 is hydrogen, and the group —C(=O)—R_8 is carboxyl or lower alkoxycarbonyl, or a therapeutically acceptable salt thereof.

7. A pharmaceutical preparation containing an antiinflammatory effective amount of a compound as claimed in claim 1 together with conventional pharmaceutical excipients.

4,420,491

HYPOCHOLESTEREMIC FERMENTATION PRODUCTS AND PROCESS OF PREPARATION

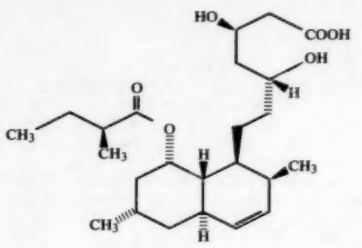
George Albers-Schonberg, Princeton, N.J.; Henry Joshua, Staten Island, N.Y., and Maria B. Lopez, Elizabeth, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 154,157, May 28, 1980, Pat. No. 4,294,846, which is a continuation-in-part of Ser. No. 77,807, Sep. 21, 1979, abandoned. This application May 28, 1981, Ser. No. 267,972

Int. Cl.³ C07C *69/28, 69/76*; A61K *31/22*

U.S. Cl. 424—311 12 Claims

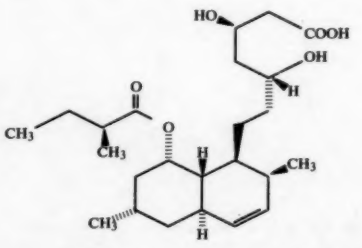
1. The compound:



II

in substantially pure form or a pharmaceutically acceptable salt or a lower alkyl ester or a substituted lower alkyl ester wherein the substituent is phenyl, dimethylamino, or acetylamino.

7. An antihypercholesterolemic pharmaceutical composition comprising a pharmaceutical carrier and an effective antihypercholesterolemic amount of the compound:



II

in substantially pure form or a pharmaceutically acceptable salt or a lower alkyl ester or a substituted lower alkyl ester wherein the substituent is phenyl, dimethylamino, or acetylamino.

4,420,492

METHOD FOR SHUCKING BIVALVE MOLLUSKS USING MICROWAVE ENERGY

Leonard S. Taylor, Silver Spring, Md., assignor to University of Maryland, College Park, Md.

Filed Jul. 19, 1982, Ser. No. 399,164

Int. Cl.³ A22C *29/04*

U.S. Cl. 426—241 13 Claims

1. A method of opening an oyster wherein the oyster includes (a) two shells which are hinged together at one end and have edible contents therebetween, and (b) an adductor muscle coupled to and extending between the respective inner surfaces of the two shells, the adductor muscle selectively moving the shells together and apart, the method comprising the step of:

locally heating the adductor muscle of the oyster;

wherein, except for a spot at the adductor muscle, at least

substantially all the contents of the opened oyster remain raw and unheated.

4,420,493

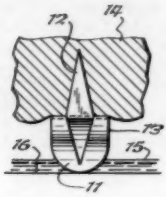
MEAT SUPPORT AND METHOD OF USE

Edward T. Greck, Amherst, N.Y., assignor to Neat Products, Inc., Amherst, N.Y.

Continuation-in-part of Ser. No. 297,701, Aug. 31, 1981, abandoned. This application Apr. 21, 1983, Ser. No. 487,105

Int. Cl.³ A47J *37/04*

U.S. Cl. 426—420 **10 Claims**



6. An elongated support device useful in cooking meats comprising:

(a) a semi-circular main raised support portion and

(b) a triangular-shaped prong integral with said main support portion and extending upwardly therefrom for piercing engagement with meat to be cooked; said main raised support portion comprising in the longitudinal direction, opposite end portions including rounded edges across the width of said device and on each end thereof and an intermediate section between said opposite end portions at a substantially higher elevation than said end portions, said triangular-shaped prong integral with said intermediate section and attached thereto at the base portion of said triangular prong, said rounded edges adapted to contact and rest in only point contact with the bottom of a cooking vessel, said semi-circular main raised portion having a horizontally planar surface wherein any point on a transverse line drawn across any part of the width of said surface is substantially equidistant from the bottom surface of said cooking vessel, and wherein the portions of said intermediate section immediately and horizontally adjacent to said prong are substantially parallel with the said surface of said cooking vessel; said support device dimensioned and shaped to be use in combination with a plurality of other said support devices such that said supports, being applied to the bottom surface of meat to be cooked by piercing, supports said meat above the bottom of a cooking pan with said rounded edges in point contact with the pan.

4,420,494

PROCESS FOR MAKING SKIN-ON POTATO BOATS

Jerome J. Glantz, Tualatin, Oreg., assignor to Lamb-Weston, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 380,066, May 20, 1982, abandoned. This application Aug. 20, 1982, Ser. No. 409,870

Int. Cl.³ A23L *1/216*

U.S. Cl. 426—441 **29 Claims**

1. A method of preparing a potato boat comprising the steps of:

blanching a whole potato under conditions and for a period of time sufficient to gelatinize the outer layer of the potato to a desired thickness, thereby leaving an ungelatinized center portion;

slicing the potato into sections to form a potato section having an exposed cut surface containing a gelatinized outer layer and an ungelatinized center portion; and

impinging an abrading means upon the exposed cut surface of the potato section to remove the ungelatinized portion

of the potato section while leaving the gelatinized outer layer of the potato section substantially intact.

4,420,495

METHOD AND APPARATUS FOR PREPARING FOAMY SAUCES OR THE LIKE

Josef Hammer, Freiburg i. Br.; Lothar Schiel, Waldkirch, and Hans Kratt, Mannheim, all of Fed. Rep. of Germany, assignors to Grossküchenanlagen Ing. Josef Hammer, Freiburg i. Br., Fed. Rep. of Germany

Filed May 18, 1981, Ser. No. 264,827

Claims priority, application Fed. Rep. of Germany, May 17, 1980, 3018956; Oct. 22, 1980, 3039797

Int. Cl.³ A23C *15/04;* **A23L** *1/24, 1/22*

U.S. Cl. 426—564 **17 Claims**

1. A method of producing a sauce comprising the steps of:

(a) mixing a plurality of ingredients including butter and/or a butter substitute and egg yolk to form a semifinished sauce in substantially non-foamy condition;

(b) storing said semifinished sauce without substantial spoilage thereof; and

(c) admitting a gas into and homogenizing said semifinished sauce subsequent to the storage step to convert said semifinished sauce into a foamy sauce for consumption.

4,420,496

LOW TEMPERATURE RELEASE AGENT COMPOSITIONS PARTICULARLY USEFUL FOR FROZEN FOOD PRODUCTS

Harold W. Hanson, Jr., Newport Beach, and Cody Munhofen, Huntington Beach, both of Calif., assignors to Par Way Manufacturing Co., Los Angeles, Calif.

Continuation-in-part of Ser. No. 89,500, Oct. 30, 1979, abandoned. This application Oct. 21, 1980, Ser. No. 199,373

Int. Cl.³ A23D *5/02*

U.S. Cl. 426—609 **10 Claims**

1. A method for the reduction of surface tension and adhesion between contacting material surfaces in a low temperature range comprising the steps of:

(a) providing a release agent composition comprising:

(i) from about 4 to about 18 weight percent lecithin;

(ii) from about 20 to about 80 weight percent white mineral oil having a Saybolt viscosity at 100° F. of at least about 250 and a specific gravity at 15.6° C. of from about 0.880 to about 0.895; and

(iii) remainder being at least one oil which is substantially liquid when held at a temperature of below about 0° F. for at least 24 hours and a relatively high degree of unsaturation, above about 80 weight percent; and

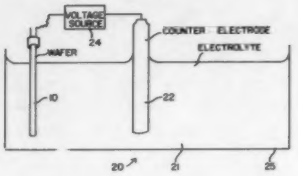
(b) applying said release agent composition to at least one contact surface of said material in an amount effective to substantially reduce the surface tensions and adhesion between contacting material surfaces; wherein the reduction of surface tension and adhesion between contacting material surfaces is effected in a low temperature range of from about 40° F. to about −150° F.

4,420,497

METHOD OF DETECTING AND REPAIRING LATENT DEFECTS IN A SEMICONDUCTOR DIELECTRIC LAYER

Andrew C. Tickle, Los Altos, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Aug. 24, 1981, Ser. No. 295,417
Int. Cl.³ B05D *5/12*; H01L *21/00*
U.S. Cl. 427—8 **14 Claims**



1. The method of detecting and repairing latent defects in a dielectric layer on a semiconductor substrate on which a circuit is to be formed which comprises:

electrically stressing the dielectric layer prior to completion of the circuit to be formed on said substrate by applying a voltage across said layer of a voltage value substantially that to which the region of said dielectric layer not containing latent defects is capable of being subjected without damage so as to damage weak areas of said dielectric layer; and

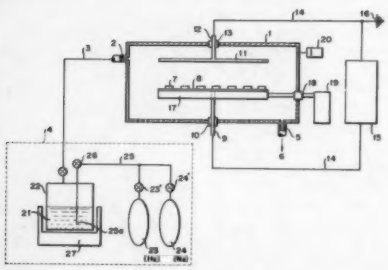
forming additional dielectric on those regions of the semiconductor substrate beneath the weak areas of dielectric damaged by said voltage prior to completion of the circuit to be formed on said substrate.

4,420,498

METHOD OF FORMING A DECORATIVE METALLIC NITRIDE COATING

Masahiko Hirose; Tsuyoshi Yasui; Yoshiharu Ochi, and Masatoshi Nakagawa, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 22, 1982, Ser. No. 390,904
Claims priority, application Japan, Jun. 26, 1981, 56-98353
Int. Cl.³ C23C *13/04*
U.S. Cl. 427—39 **7 Claims**



1. A method for forming a decorative metallic nitride coating on the surface of a substrate comprising the steps of disposing said substrate to be coated as a cathode in a material gas atmosphere at a pressure of 0.1 to 10 Torr, with said substrate maintained at a temperature of 200° to 1000° C., and applying a voltage of 200 to 8000 V to said substrate to prepare a direct current glow discharge space in the vicinity of said substrate, the improvement which comprises using as said material gas a mixed gas of a halide of titanium, zirconium or hafnium; hydrogen; and nitrogen, and controlling the current density of the electric current flowing through said substrate to be within the range of 0.01 to 1 mA/cm².

4,420,499

PROCESS FOR PROVIDING IMPROVED RADIATION-CURABLE SURFACE COVERINGS AND PRODUCTS PRODUCED THEREBY

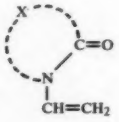
Nicholas C. Bolgiano, East Hempfield Township, Lancaster County, and William T. Sigman, Eden Township, Lancaster County, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 314,989, Oct. 26, 1981, abandoned. This application Jun. 17, 1982, Ser. No. 389,163
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—53.1 **78 Claims**

1. A process for preparing a composite layer material comprising the steps of:

depositing a first layer of a composition which is curable by exposure to actinic radiation on a support,

preparing a solution comprising water, from about 0.1 to about 75% by weight of an N-vinyl lactam having the structure

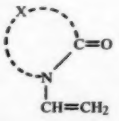


where X is an alkylene bridge having 3 to 5 carbon atoms, and from about 0.01 to about 5% by weight of a suitable surfactant which is compatible with said lactam and which enables said solution to wet said first layer,

depositing a layer of said solution on said first layer, and

exposing the pair of layers to actinic radiation.

40. A composite layer material having improved durability, abrasion resistance, and stain resistance, said material being obtained by irradiating with actinic radiation a first uncured layer which is curable by exposure to said radiation, said layer being coated prior to irradiation with a layer of an aqueous solution comprising from about 0.1 to about 75% by weight of an N-vinyl lactam having the structure



where X is an alkylene bridge having 3 to 5 carbon atoms, and from about 0.01 to about 5% by weight of a suitable surfactant which is compatible with said lactam and which enables said solution to wet said first layer.

4,420,500

COMPOSITION AND PROCESS FOR PREPARING TRANSPARENT CONDUCTING FILM

Mitsuo Nakatani, Yokohama; Mitsuo Yamazaki, Hitachi; Masaaki Okunaka, Fujisawa; Ryoichi Sudo, Yokosuka; Kenji Tochigi, Yokohama, and Hitoshi Yokono, Katsuta, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan

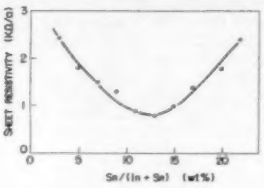
Filed Feb. 2, 1982, Ser. No. 344,973
Claims priority, application Japan, Feb. 20, 1981, 56-23111
Int. Cl.³ B05D *3/02, 3/06*; H01B *1/06*
U.S. Cl. 427—54.1 **27 Claims**

3. A process for preparing a transparent conducting film, which comprises coating a substrate with a composition com-

prising an indium compound, a tin compound, and a solvent as essential components, the tin compound being a compound represented by the following general formula:

$$(R)_aSn(NO_3)_b(X)_{4-a-b} \quad (1)$$

wherein R is an alkyl group having 1 to 4 carbon atoms, X is a hydroxyl group, a halogen atom or a carboxyl group, and a and b are integers of $1 \sim 3$ and $a+b \leqq 4$, the indium compound and the tin compound represented by the general formula (1)



being in a mixing ratio of the indium compound to the indium compound plus the tin compound of 5–20% by weight in terms of $Sn/(In+Sn) \times 100$, and total of the indium compound and the tin compound represented by the general formula (1), and the solvent being in a proportion of 2 to 80% by weight of the total of the indium compound and the tin compound represented by the general formula (1) and 98 to 20% by weight of the solvent, subjecting the coated substrate to at least one of drying and ultraviolet irradiation at a substrate temperature of 200° C. or higher, when required, and then heating the substrate at a temperature of 400° C. or higher.

4,420,501

METHOD OF FORMING COLORED OR CONDUCTIVE COATING LAYER ON GLASS SHEET

Kazuo Ueda; Yoshio Horio, both of Matsusaka; Toshiyuki Kanno, Tokyo, and Yoshio Abe, Iwatsuki, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jan. 19, 1982, Ser. No. 340,709

Claims priority, application Japan, Jan. 20, 1981, 56-5980

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—54.1 **9 Claims**

1. A method of forming a colored coating layer on a glass sheet, comprising the steps of:

applying a paint comprising an inorganic pigment, a powdered glass and an organic liquid binder onto a major surface of the glass sheet so as to form a paint layer on said surface of the glass sheet, said liquid binder consisting essentially of at least one acrylate selected from the group consisting of monofunctional acrylates polymerizable by radiation of ultraviolet rays and bifunctional acrylates polymerizable by radiation of ultraviolet rays, said at least one acrylate having a room temperature viscosity suitable for a binder in a paint or paste for use in printing and capable of being completely decomposed without leaving solid carbon during a firing process adequate to fuse said glass powder of said paint;

rendering said paint layer hard and untacky by radiation of ultraviolet rays;

firing the glass sheet after hardening of said paint layer so as to melt said glass contained in the hardened paint layer and burn out the organic component of the hardened paint layer; and

cooling the fired glass sheet.

4,420,502

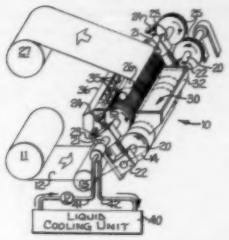
APPARATUS AND METHOD FOR PRODUCING A FLEXIBLE SHEET MATERIAL HAVING A PREDETERMINED SURFACE CHARACTERISTIC

Kenneth E. Conley, 3308 Mikelynn La., Matthews, N.C. 28105

Continuation of Ser. No. 184,286, Sep. 5, 1980, abandoned. This application Mar. 18, 1982, Ser. No. 359,291

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—54.1 **19 Claims**



1. An apparatus for producing a flexible sheet material having a predetermined surface characteristic of high quality and fine definition formed on one side thereof, said apparatus comprising

a first cylindrical roll,

a second cylindrical roll having a peripheral surface of a predetermined texture corresponding to the desired surface characteristic to be produced in the sheet,

means for mounting said first and second rolls with the peripheral surfaces thereof spaced apart a predetermined distance to form a fixed narrow gap of predetermined width therebetween,

means operatively connected to each of said first and second rolls for rotating said first and second rolls at substantially equal peripheral speeds and in opposite direction of rotation,

means for directing a base web of predetermined thickness less than the width of said fixed narrow gap onto the peripheral surface of said first rotating roll and over a predetermined arcuate path therealong and passing through the fixed narrow gap between said first and second rolls,

means for applying to the exposed surface of the base web as it advances along the peripheral surface of said first rotating roll a coating of a flowable uncured thermosetting resin,

means for directing the base web from the first roll and for guiding the coated surface of the base web onto the peripheral surface of said second roll and over a predetermined arcuate path therealong,

means for curing the coating of uncured thermosetting resin while it is in contact with the peripheral surface of said second roll to cure and harden the coating, and

means for directing the base web away from said second roll to thereby separate the cured coating from the peripheral surface of said second roll and to thus provide a sheet with a predetermined surface characteristic of high quality and fine definition accurately reproducing the predetermined surface texture of said second roll.

12. A method for producing a flexible sheet material having a predetermined surface characteristic of high quality and definition formed on one side thereof, said method comprising

advancing a base web along a predetermined path of travel while directing one surface of the base web onto the peripheral surface of a first roll and while rotating said roll,

advancing the base web along an arcuate path around the periphery of the first rotating roll while applying to the

exposed surface of the advancing base web a coating of a flowable uncured thermosetting resin,

then directing the advancing base web and the coating of uncured flowable resin thereon from the first roll and guiding the coated surface of the base web onto a second roll spaced apart from the peripheral surface of said first roll a predetermined distance to form a fixed narrow gap therebetween of a width greater than the thickness of said base web, and while rotating said second roll at a peripheral speed substantially equal to that of said first roll, said second roll having a peripheral surface with a predetermined texture corresponding to the desired surface characteristic to be produced in the sheet,

advancing the base web along an arcuate path around the periphery of the second roll while maintaining the coating of uncured thermosetting resin in contact with the peripheral surface thereof and while contacting the coating with a curing agent to thereby cure and harden the coating, and

directing the base web away from the second roll to thereby separate the cured and hardened coating from the peripheral surface of the second roll and to thus produce a sheet with a predetermined surface characteristic of high quality and fine definition accurately reproducing the predetermined surface texture of said second roll.

4,420,503

LOW TEMPERATURE ELEVATED PRESSURE GLASS FLOW/RE-FLOW PROCESS

Chung W. Leung, Belle Mead; Robert H. Dawson, Princeton, both of N.J.; Martin A. Blumenfeld, Tequesta, Fla., and Dennis P. Biondi, Santa Ana, Calif., assignors to RCA Corporation, New York, N.Y.

Filed May 17, 1982, Ser. No. 379,103

Int. Cl.³ H01L *21/316*

U.S. Cl. 427—85 **9 Claims**

1. A process for forming tapered apertures in a glass layer of a semiconductor device comprising the steps of:

forming the glass layer;

forming apertures in the glass layer;

maintaining the glass layer at an elevated pressure above atmospheric pressure;

heating the glass layer at the elevated pressure; and

maintaining the heated glass layer at the elevated pressure for a period of time sufficient to only soften the layer and taper the edges of the apertures.

4,420,504

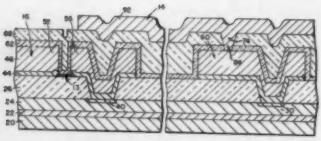
PROGRAMMABLE READ ONLY MEMORY

Kersi F. Cooper, San Jose, and Jerry W. Drake, Los Gatos, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 219,124, Dec. 22, 1980, abandoned. This application May 17, 1982, Ser. No. 378,585

Int. Cl.³ B05D *5/12;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*

U.S. Cl. 427—90 **17 Claims**



1. A method comprising the steps of:

(a) forming a layer of fusible material on a body;

(b) forming a first metallization layer in contact with a portion of the layer of fusible material;

(c) forming a first insulating layer over the first metallization layer and over a portion of the layer of fusible material;

(d) forming a second insulating layer of a material different from the first insulating layer over the first insulating layer with the thickness of the second insulating layer being greater than the thickness of the first insulating layer;

(e) forming a via through a region of the first and second insulating layers exposing an underlying portion of the first metallization layer; and

(f) depositing a second metallization layer over the second insulating layer and through the via onto the exposed underlying portion of the first metallization layer.

4,420,505

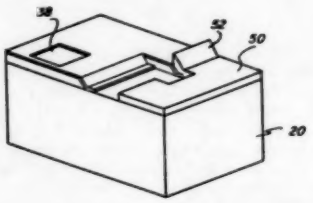
METHOD OF MAKING A THIN FILM MAGNETIC HEAD HAVING GOOD LOW FREQUENCY RESPONSE

Benjamin B. Meckel, Del Mar, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 231,201, Feb. 4, 1983, Pat. No. 4,399,479. This application Mar. 28, 1983, Ser. No. 479,420

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—131 **4 Claims**



1. A method useful in the manufacture of a thin film magnetic head having good long wavelength response comprising the steps of:

(a) depositing a first film of magnetic material on a first part of a substantially planar non-magnetic substrate, the second part thereof being shielded from said deposition by means of a mask,

(b) during said deposition of said first film of magnetic material, moving said mask to reveal more, but not all, of said second part of said substrate, thereby tapering an edge of said first film,

(c) depositing a non-magnetic film on the tapered edge of said first film of magnetic material, and

(d) depositing a second magnetic film on said second part of said non-magnetic substrate and upon the non-magnetic film on said tapered edge of said first film,

said two magnetic films constituting a pair of head poles, and said non-magnetic film constituting a slant gap structure between said poles.

4,420,506

METHOD OF MANUFACTURING AN ARTICLE OF A SYNTHETIC RESIN WHICH HAS A METAL LAYER

Johan W. A. Nelissen; Johannes J. Ponjee; Petrus E. J. Legierse, and Johannes Van Ruler, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 338,708, Jan. 11, 1982, abandoned. This application Sep. 17, 1982, Ser. No. 419,350

Claims priority, application Netherlands, Jul. 16, 1981, 8103375

Int. Cl.³ B05D *1/38, 3/10*

U.S. Cl. 427—162 **6 Claims**

1. A method of manufacturing a synthetic resin provided on at least a part of its surface with a metal layer comprising

(A) polymerizing a monomer composition comprising monomeric acrylates and a polymerizable N-substituted pyrrolidon compound,

(B) treating the resulting synthetic resin article with an aromatic carboxylic acid which in the nucleus is substituted with one or more hydroxy groups or glucose derivatives thereof,

(C) providing the resultant treated article, by electroless deposition, with a metal layer.

4,420,507

PROCESS FOR IMPROVING OPACITY OF POLYESTER TEXTILE MATERIALS

Francis W. Marco, Pauline, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 128,619, Mar. 10, 1980, Pat. No. 4,283,452, which is a continuation-in-part of Ser. No. 72,959, Sep. 6, 1979, abandoned, which is a continuation-in-part of Ser. No. 40,032, May 17, 1979, abandoned. This application Dec. 10, 1980, Ser. No. 215,193

Int. Cl.³ B05D *5/00*; D06C *29/00*

U.S. Cl. 427—170 16 Claims

1. A process for improving opacity of a polyester fiber-containing textile material comprising the steps of:

(a) providing an aqueous dispersion of titanium dioxide pigment having a particle size of at least about 0.18 micron;

(b) contacting said textile material with said aqueous dispersion under agitation conditions and at a pH of less than about 7.5 whereby said titanium dioxide pigment exhausts from said dispersion; and

(c) thereafter heat setting said material.

4,420,508

POWDER COATING THE INTERIOR OF PIPE

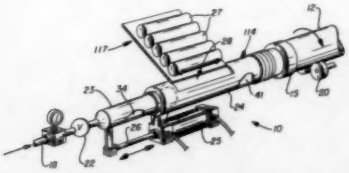
Jack E. Gibson, 4905 Pepperidge Pl., Odessa, Tex. 79762

Continuation-in-part of Ser. No. 118,660, Feb. 4, 1980. This application Feb. 23, 1981, Ser. No. 237,380

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.³ B05D *1/06, 7/22*

U.S. Cl. 427—183 13 Claims



1. Method of powder coating the interior of a tubular element with a synthetic plastic resin material comprising the steps of:

(1) preheating the element to a temperature in excess of the fusion temperature of a synthetic plastic resin powder;

(2) rotating the preheated element about its longitudinal axis at a speed which enables any subsequently fused plastic resin material to spread into a continuous film;

(3) measuring powdered synthetic resin material to provide a single charge of powdered material which is sufficient for coating the entire interior surface of the preheated element;

(4) placing the single charge into a container which has an inlet opposed to an outlet; closing said inlet and said outlet with a closing member;

(5) placing said container within an enclosure, communicating said enclosure with one end of the preheated element by connecting a flow conduit to said enclosure at a location downstream of said charge and connecting the other end of said flow conduit to one end of the preheated rotating element;

(6) connecting a supply of compressed air to said enclosure at a location upstream of said container;

(7) flowing compressed air from said supply, into said enclosure, and into said inlet of said container, thereby placing a pressure differential across the container;

(8) opening said inlet and said outlet by using the pressure differential across the container to cause the closure members at the container inlet and outlet to be moved to an opened position, whereupon flow of compressed air occurs through said container, and the single charge is formed into a pocket which moves in advance of the air flowing from the supply;

(9) flowing the compressed air from said supply, through said enclosure, and through said element at a rate which moves the entire charge from the container located within said enclosure in advance of the flowing air to push the charge into said rotating preheated element as a pocket of powder, so that the powder contained within the pocket contacts the interior wall surface of the rotating preheated element and is fused into a coating in a single pass of the pocket through the element; and,

(10) cooling the coated element to a temperature below the fusion temperature of the plastic.

4,420,509

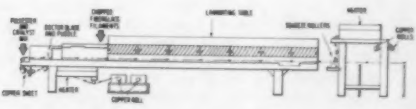
COPPER-CLAD POLYESTER-GLASS FIBER LAMINATES

David Barrell, Temple City; Donald E. Kennedy, Baldwin Park; James J. Marino, Jr., Monrovia, and Donald C. Rollen, Railto, all of Calif., assignors to Glastеel Tennessee, Inc., Collierville, Tenn.

Filed Aug. 11, 1981, Ser. No. 291,929

Int. Cl.³ B05D *3/00*

U.S. Cl. 427—206 13 Claims



1. A continuous process for preparing a copper foil laminate having at least one sheet of copper foil directly bonded to a face of a sheet of a glass fiber reinforced linear polyester resin, comprising:

applying a coating of a linear polyester resin to a first copper foil,

distributing glass fiber filaments on said linear polyester resin coating,

heating said glass fiber containing linear polyester resin coated copper foil to partially gel said resin,

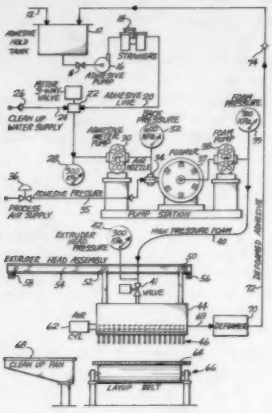
applying pressure to said partially gelled linear polyester resin coated copper foil, and

curing said linear polyester resin.

4,420,510
METHOD FOR APPLYING A FOAMED ADHESIVE UNDER START-STOP CONDITIONS

Arden L. Kunkel, Tacoma, and Darrell E. Pierson, Federal Way, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 23, 1982, Ser. No. 360,852
Int. Cl.³ B05D 5/10
U.S. Cl. 427—208.2 **23 Claims**



1. A process for applying a uniform amount of a foamed adhesive to a substrate normally moving at a uniform rate of speed but subject to stops and starts at irregular intervals which comprises:

a. extruding a predetermined amount of the foamed adhesive from an extrusion head onto the moving substrate;

b. sending a signal to stop the conveyor line moving the substrate, simultaneously closing a first valve to cut off the supply of foamed adhesive to the extrusion head, said valve being located in the foamed adhesive supply line in the proximity of the extrusion head so as to define a predetermined volume of foamed adhesive remaining under residual pressure in the head;

c. permitting the foamed adhesive remaining in the extrusion head to continue to flow onto the decelerating substrate from the action of the retained pressure so that it is applied at a decreasing rate as the residual pressure in the extrusion head drops; and

d. at approximately the time when the substrate has decelerated to a complete stop, closing a second valve located at a point in the extrusion head system where the foamed adhesive is at essentially atmospheric pressure in order to stop any further flow of adhesive onto the substrate so that during the deceleration period the substrate receives an essentially uniform spread weight & foamed adhesive without overspreading or creating adhesive free gaps.

4,420,511
METHOD FOR COATING AN OBJECT

Kurt H. Liedberg, Skara, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jun. 13, 1979, Ser. No. 48,014
Claims priority, application Sweden, Jun. 13, 1978, 7806810
Int. Cl.³ B05D 7/22
U.S. Cl. 427—236 **5 Claims**

1. A method for coating at least one surface of an object with a liquid coating material having thixotropic properties comprising

spraying said coating material on a major portion of said at least one surface to partially coat said at least one surface,

applying mechanical vibrations or repeated impact forces to said at least one surface which is partially coated with said coating material to decrease the viscosity of said material coated on said major portion of said at least one surface so that said material flows over the uncoated portions of said at least one surface, and

then stopping said application of mechanical vibrations or repeated impact forces to cause said coating material to gel and cease to flow.

2. The method of claim 1 wherein said at least one surface of said object which is being coated comprises the interior walls of a hollow body on which the coating material is applied by spraying through one or more injection openings in said hollow body, and wherein said mechanical vibrations or repeated impact forces are applied to the outside of said hollow body and wherein said hollow body transmits said mechanical vibrations or repeated impact forces to the said at least one surface.

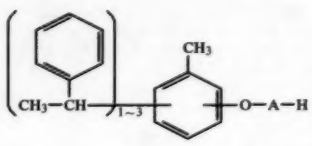
4,420,512
EMULSION TYPE SIZING AGENT FOR CARBON FIBERS, PROCESS FOR ITS PREPARATION, AND METHOD FOR USING SAME

Hiroyasu Ogawa, Mishima, and Mikio Shima, Shizuoka, both of Japan, assignors to Toho Beison Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1982, Ser. No. 415,198
Claims priority, application Japan, Sep. 7, 1981, 56-139701
Int. Cl.³ B05D 3/02
U.S. Cl. 427—386 **20 Claims**

17. A method for sizing carbon fibers, comprising: depositing on the fibers a sizing agent containing:

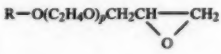
a compound represented by the following general formula (I):



(I)

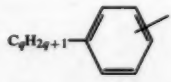
wherein A represents $(C_2H_4O)_l$ or $(C_2H_4O)_n(C_3H_6O)_m$ [l is 18 to 70; n is 18 to 70; and m is 2 to 50 $(1 \leqq n/m \leqq 35)$];

a compound represented by the following general formula (II):



(II)

wherein R represents C_qH_{2q+1} or



(q is 10 to 18; and p is 15 to 70); and an epoxy resin.

4,420,513
SYNTHETIC RUNNING SURFACE

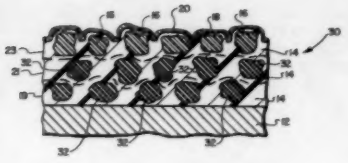
Harry E. Coke, and Gary W. Gill, both of Carrollton, Tex., assignors to Southwest Techni-Systems, Inc., Dallas, Tex.

Filed Aug. 21, 1981, Ser. No. 295,023
Int. Cl.³ B05D 3/02
U.S. Cl. 427—407.1 **13 Claims**

1. A method for forming a synthetic surface particularly adapted for use as a running track comprising the steps of:

providing a quantity of a liquid composition which is curable to form a solid elastomeric coating;

mixing into said liquid composition a quantity of particles of solid elastomeric material sufficiently to substantially encapsulate said particles by said liquid composition and to obtain a substantially dispersed mixture; and



applying said mixture to a substrate in a plurality of discrete layers and wherein the concentration of said particles by weight in the top layer of said surface is greater than in the bottom layer.

4,420,514

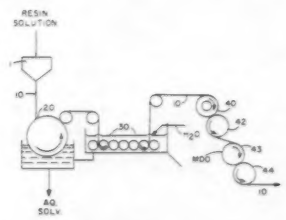
POLYMER FILM TREATMENT WITH ORGANIC IMPREGNANT

Gordon P. Hungerford, Palmyra, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 255,029, Apr. 17, 1981, Pat. No. 4,391,939. This application Sep. 1, 1982, Ser. No. 413,868

Int. Cl.³ D01F *6/18*; B29C *25/00*; B05D *1/18*

U.S. Cl. 427—430.1 **7 Claims**



1. A continuous process for impregnating a polyacrylonitrile aquagel film with a totally or highly water-soluble poly (ethylene glycol) having a molecular weight within the range of from about 285 to about 7500 comprising:

passing the aquagel film at substantially constant rate through a water solution of said poly (ethylene glycol), said aquagel containing at least about 40 weight % water uniformly dispersed in the polyacrylonitrile;

contacting the aquagel strip with aqueous solution during a predetermined residence time in the bath;

passing the aquagel strip from the bath while removing excess aqueous poly (ethylene glycol) therefrom; and

metering poly (ethylene glycol) to the aqueous solution at a concentration greater than the aqueous solution of the bath at a rate substantially proportional to desired steady state treatment of poly (ethylene glycol) for the aquagel strip.

4,420,515

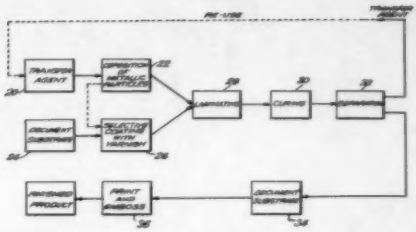
METALLIZATION PROCESS FOR PROTECTING DOCUMENTS OF VALUE

Maurice A. Amon, New York, N.Y., and Haim Bretler, Lausanne, Switzerland, assignors to Sicpa Holding, S.A., Glarus, Switzerland

Filed Aug. 21, 1981, Ser. No. 295,014

Int. Cl.³ B32B *3/30*; B44C *1/16*; B41M *3/14*

U.S. Cl. 428—29 **5 Claims**



1. A process for preventing the counterfeiting of a valuable document comprising the steps of:

depositing, on a reusable transfer agent, a film of metallic particles of the order of magnitude of substantially less than 1000 Angstroms in thickness; coating portions of a valuable document substrate with varnish at predetermined locations; laminating said valuable document substrate and said transfer agent together before said varnish is cured so that said metallic particles are embedded in said varnish at said predetermined locations; curing said varnish; separating said transfer agent from said valuable document substrate whereby said valuable document substrate is provided at said predetermined locations with said film of metallic particles, which film permits some light transmission, appears continuous and smooth, and exhibits a specular metallic finish; and simultaneously printing and embossing said valuable document substrate, said printing being applied to locations other than said predetermined locations and said embossing being applied only at said predetermined locations so as to form a latent image in said film of metallic particles in said predetermined locations, said latent image being clearly visible from a first angle of view and being essentially invisible from a second angle of view and said latent image being formed without the use of ink.

4,420,516

COMPOSITE FILMS FOR DEEP-DRAWN PACKINGS

Wolfgang Ernst; Hans W. Funk, both of Bomlitz, and Rudi Klein, Walsrode, all of Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,307

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114771

Int. Cl.³ B65D *3/28*; B32B *27/10*

U.S. Cl. 428—35 **15 Claims**

1. A heat-sealable composite film shrinkable by deep drawing, which comprises

(1) at least one layer of at least one copolyamide 6/12 containing at least 50% by weight of ϵ-caprolactam units and having a melting temperature of 75° to 215° C.,

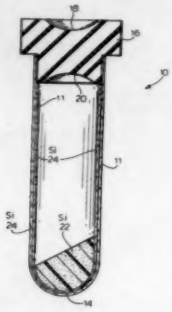
(2) at least one heat-sealable layer of a copolymer containing at least 50 mole percent of ethylene and, optionally,

(3) an adhesive or adhesion-promoting layer between layers 1 and 2.

4,420,517
METHODS FOR IMPROVING UNIFORMITY OF SILICA FILMS ON SUBSTRATES

Keramat Ali, Sumter, S.C., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed May 6, 1982, Ser. No. 375,635
Int. Cl.³ A01N 1/02; B05D 3/02; B32B 9/04
U.S. Cl. 428—35 16 Claims



9. A blood collection container with a uniform blood releasable silica film coating the internal surfaces thereof, obtained by the process of

(a) forming a mixture by admixing ethylsilicate and isopropyl alcohol;

(b) adding to the mixture formed from said forming step a hydrolyzing material;

(c) hydrolyzing said mixture obtained from said forming and adding steps to obtain a sol;

(d) coating said sol obtained from said hydrolyzing step onto said internal surfaces of said blood collection container; and

(e) heating said coating from said coating step at elevated temperatures for the period of time necessary to dry said coating.

4,420,518
HOT MELT RECHARGE SYSTEM

Donald J. Progar, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 24, 1982, Ser. No. 361,215
Int. Cl.³ B32B 7/02; C09J 7/00
U.S. Cl. 428—40 6 Claims

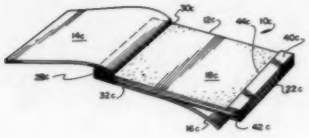
1. An article of manufacture comprising in combination with a strip of hot melt adhesive composition, means for positioning and utilizing said strip of solid hot melt adhesive at a point of use therefor;

said means including a first protective sheet in contact with one surface of said strip of hot melt adhesive and extending beyond the edge surfaces thereof, a second protective sheet in contact with the opposite surface of said strip of adhesive and extending beyond the edge surfaces thereof and having a length short of the length of said first protective sheet, said second protective sheet having a pressure sensitive adhesive layer thereon to provide attachment thereof to said strip of hot melt adhesive and said first protective sheet to thereby sandwich said strip of hot melt adhesive therebetween, and reinforced tab ends on each of said first and said second sheets to facilitate separation and removal of both said sheets for exposed utilization of said hot melt adhesive strip at the point of use thereof.

4,420,519
NAPKIN RETAINER

Charles O. Slemmons, 679 Ardleigh Dr., Akron, Ohio 44303

Continuation of Ser. No. 255,305, Apr. 17, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 426,938
Int. Cl.³ B32B 7/10; B41L 1/04; G09F 19/00; A45F 5/04
U.S. Cl. 428—40 2 Claims

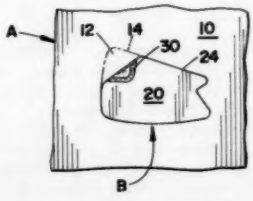


1. A napkin retainer comprising a tape portion having adhesive coating on both sides and top and bottom protective covers each having adhesive release agent coated on one side, the tape portion being sandwiched between the top and bottom protective covers and juxtaposed with the adhesive release side of the top and bottom protective covers adjacent the adhesive of the tape portion, the top and bottom protective covers each having a hinge strip along one end without the adhesive release agent coated thereon and each protective cover having a nonserving score line located along a boundary between the adhesive release agent on each protective cover and the hinge strip so that the protective covers are permanently attached to the tape portion along a first end of the tape portion and will remain in their folded back position, and wherein the top and bottom protective covers are coextensive with the tape portion and each have a second end, remote from the hinge strip, that is cut laterally to provide pick tabs which will not be snagged during handling.

4,420,520
AREA COATED PAINT MASK AND METHOD

Wallace R. Jones, Waite Hill Village; Paul A. Krieger, Bay Village, and John F. Haas, Chagrin Falls, all of Ohio, assignors to The Excello Specialty Company, Cleveland, Ohio

Continuation of Ser. No. 165,721, Jul. 3, 1980, abandoned. This application Apr. 5, 1982, Ser. No. 365,481
Int. Cl.³ B32B 7/10
U.S. Cl. 428—42 8 Claims



1. A method of masking a workpiece to facilitate spray painting of a workpiece first area which is separated from a workpiece second area by a continuous demarcation zone, said method comprising:

providing a thin, flexible paint mask sheet having opposed faces; applying an adhesive coating to one face of said mask sheet in a manner forming an adhesive band similar in overall contour to the outline of said demarcation zone

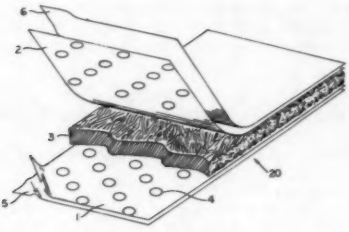
and having one side edge extending along said mask sheet at least substantially coextensive with said demarcation zone with another side edge laterally spaced from said one side edge, said mask sheet and adhesive being capable of withstanding 350° F. oven baking for at least one hour; applying a release surface on the other face of said mask sheet releasably compatible with said adhesive; stacking a plurality of identical mask sheets to produce a mask pad having a predetermined number of identical ones of said mask sheets disposed in a stacked relationship with on face of each mask sheet directly engaging the release surface on the other face of the next adjacent mask sheet; cutting said stacked mask sheets to form a plurality of masks each having a peripheral edge of the same general conformation as the demarcation zone and with said adhesive band on one side edge disposed on said mask at least adjacent said peripheral edge; individually removing a mask from said pad; placing said mask on said workpiece second area with said mask peripheral edge being positioned to at least generally correspond to said continuous demarcation zone; causing said mask to precisely cover said workpiece second area along and coextensive with said demarcation zone at least at said adhesive band one side edge; directing a paint spray toward said workpiece to effect painting of said workpiece first area; and, removing said mask from association with said workpiece.

4,420,521

THERMAL GARMENT DESIGN

George S. Carr, 5307 Gallatin St., Hyattsville, Md. 20781

Filed Mar. 25, 1982, Ser. No. 361,755
Int. Cl.³ A41D *1/22*
U.S. Cl. 428—74 **4 Claims**



1. In combination:
a thermal garment insulation means of a fiber layer sandwiched between two layers of fabric;
said fiber and fabric layers with two reflective plastic film layers intervening;
said plastic film layers having venting holes offset from one another in opposing layers.

4,420,522

PILE FABRIC PRODUCTION METHOD USING POLYURETHANE BINDING AGENT

Yutaka Masuda, Otsu; Toshiaki Takai, Ehime, and Shunroku Tohyama, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,192
Claims priority, application Japan, Dec. 15, 1981, 56-200905
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—95 **6 Claims**

6. The pile fabric which is prepared by binding a pile component, using as a pile binding agent a combination comprising:
(a) a compound which contains two or more aziridine groups or two or more blocked isocyanate groups in one molecule, and
(b) a polyurethane binding agent solution which satisfies the formula

$$0.10 \leq (\log P + 1) \leq 0.2$$

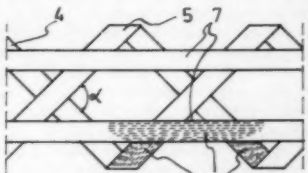
wherein P is the viscosity in poise of polyurethane solution and C is the concentration of polyurethane.

4,420,523

ENERGY-ABSORBING LAMINATE

Andre Wieme, Zwevegem, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Filed Jan. 24, 1983, Ser. No. 460,165
Claims priority, application Belgium, Feb. 1, 1982, 1/10411
Int. Cl.³ B32B *5/12*
U.S. Cl. 428—109 **6 Claims**



1. An energy-absorbing laminate comprising at least one layer (1) of a stiff material which on at least one of its plane sides throughout a part of its surface is covered with an elastomer layer (2) in which twisted fiber bundles (3) are embedded, characterized in that this elastomer layer (2) is in the form of a grid structure, built up of at least two series of substantially parallel elastomer strips (4, 5) reinforced with twisted fiber bundles (3), which strips intersect at an angle α between 10° and 120° and which are bonded to one another in the common contact areas (6).

4,420,524

BITUMEN, ATACTIC POLYPROPYLENE AND PROPYLENE/ETHYLENE COPOLYMER COMPOSITIONS AND WATER-PROOFING MEMBRANES USING THE SAME

Romolo Gorgati, Bologna, Italy, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

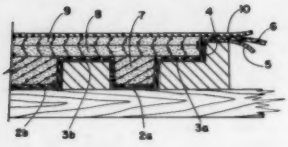
Continuation-in-part of Ser. No. 273,212, Jun. 12, 1981, Pat. No. 4,368,228, which is a continuation-in-part of Ser. No. 143,138, Apr. 23, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 426,295
The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.
Int. Cl.³ B32B *5/12*
U.S. Cl. 428—110 **10 Claims**

1. A prefabricated waterproofing membrane which comprises a series of superposed reinforcing layers including a fiberglass mat and a bonded fiberglass net/polyester mat, said layers being impregnated with bitumen mixed with at least one thermoplastic polymer selected from the group consisting of an amorphous copolymer of ethylene/propylene, atactic polypropylene, polyisobutylene and styrene-butadiene-styrene block copolymer, the bitumen polymer mixture having a ring and ball softening point of at least 105° C.

4,420,525
THIN DECORATIVE CEMENTITIOUS VENEERS AND A METHOD FOR MAKING SAME

David M. Parks, 119 Colonial Rd., Great Neck, N.Y. 11021

Filed Feb. 11, 1982, Ser. No. 347,999
Int. Cl.³ B32B 3/00; B29C 9/00
U.S. Cl. 428—156 16 Claims

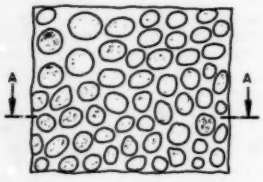


1. A method of making a thin decorative cementitious veneer of about 5 of 60 mils thick which comprises the steps of:
providing at least one waterproof mold with an engraving having an intaglio design or pattern;
placing an overhanging wet cloth on the engraved mold;
placing a plastic hydraulic colored cement mix onto said wet cloth and forcing said cement mix into the incised portions of the engraving to simultaneously form a casting and a temporary cloth mold which is the exact copy of the original mold;
compacting said plastic cement, by removing excess water;
immediately removing said cement casting together with the temporary cloth mold from the engraved mold before it sets;
removing the temporary cloth casting from said plastic cement casting before it sets;
and storing said plastic casting unitl it sets by air curing.

4,420,526
SOUND ABSORBING IRREGULARLY SHAPED PANEL

Hermann Schilling, and Reinhard Stief, both of Weinheim, Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Sep. 29, 1981, Ser. No. 306,861
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039651
Int. Cl.³ B32B 5/14
U.S. Cl. 428—171 10 Claims

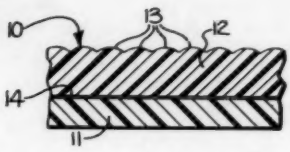


1. A sound absorbing, irregularly shaped panel comprising a deep-drawn, non-woven fabric of matted endless intersecting polyester fibers, said fibers having a denier of from about 4 to 12, and a distribution of fine pores on their surfaces, said fibers being autogenously bonded together at their points of intersection and bonded together in the immediate vicinity of said intersection points by a cross-linked chemical binder, so as to prevent covibration of said fibers in response to absorbed sound waves, said fabric being compressed to a degree such that a shaped panel having a thickness of 1 to 3 mm has an acoustical impedance of from about 30 to about 100 Rayl.

4,420,527
THERMOSET RELIEF PATTERNED SHEET

Kenneth E. Conley, Matthews, N.C., assignor to Rexham Corporation, New York, N.Y.

Division of Ser. No. 184,240, Sep. 5, 1980. This application Aug. 24, 1981, Ser. No. 295,706
Int. Cl.³ B32B 3/00; G02B 27/00; B05B 5/00
U.S. Cl. 428—172 13 Claims



1. A flexible, composite sheet material having a patterned relief surface of high quality and definition said composite sheet material comprising a flexible base film having opposing front and rear surfaces with the distance therebetween varying over the extent of the base film due to inherent accuracy limitations in the production of said base film and resulting in relatively small but measurable variations in the thickness of the base film, and a continuous coating of a cured thermosetting polymer extending over substantially the entire front surface of said base film and bonded thereto, said coating having a nonplanar outer surface defining a predetermined relief pattern of high quality and durability and of fine definition in said thermosetting polymer layer, the thickness of said cured thermosetting polymer layer in which said relief pattern is formed compensatingly varying in relation to said variations in thickness of said base film so that the distance from the outermost surface portions of the relief pattern to the rear surface of said base film is uniform throughout the sheet material in spite of said variations in thickness of the base film whereby variations in thickness in the overall composite sheet are eliminated.

4,420,528
TRANSFER FILM FOR ELECTROPHOTOGRAPHIC COPIER

Toshiaki Okiyama, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 278,029, Jun. 29, 1981, abandoned. This application Jan. 28, 1983, Ser. No. 461,713
Claims priority, application Japan, Jun. 30, 1980, 55-89415
Int. Cl.³ B32B 5/16, 27/06
U.S. Cl. 428—220 2 Claims

1. A transfer film of the type used in connection with an electrophotographic copier, comprising:
polysulfone resin, wherein said film comprised of polysulfone resin is matted and has a dynamic friction coefficient of from 0.6 to 2.0, a static friction coefficient of from 0.8 to 2.3, comprises an inorganic or organic particulate additive in an amount to provide a surface resistance of from 1×10^{10} to 1×10^{15} ohms, wherein at least one side of said film has a surface roughness of 2.0 micron or more, said film being self-supporting and having a thickness of from 25 to 100 μm.

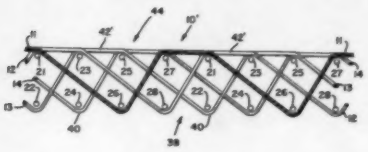
4,420,529
ANTI-STATIC DRYER FABRICS

William T. Westhead, Waycross, Ga., assignor to Scapa Dryers, Inc., Waycross, Ga.

Filed Aug. 22, 1980, Ser. No. 180,444
Int. Cl.³ B32B 5/16
U.S. Cl. 428—244 30 Claims

1. A dryer fabric having face and back surfaces, said dryer fabric comprising:
a plurality of machine direction and cross-machine direction

yarns interwoven to define machine roll contacting floats on both the face and back surfaces of said fabric, a select number of the yarns that define said floats being anti-static yarns, said select number of yarns chosen so that floats



defined by anti-static yarns are present on both the face and back surfaces of said fabric, each of said anti-static yarns comprising a non-conductive synthetic yarn incorporating a component exhibiting anti-static properties.

4,420,530

COATING AGENTS AND THERMOPLASTIC RESIN FILMS COATED THEREWITH

Takashi Toyoda; Yozo Ohba; Masaaki Yamanaka, all of Omigawa, and Kanji Shirai, Hazaki, all of Japan, assignors to Oji Yuka Goseishi Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 356,149

Claims priority, application Japan, Mar. 12, 1981, 56-34568

Int. Cl.³ B32B *5/16, 27/32*

U.S. Cl. 428—323 **7 Claims**

1. A coated film having excellent printability which comprises a base film having a surface layer of a polyolefin film containing an inorganic fine powder, said film having on the surface thereof 5 cracks/mm^2 or more and which cracks are 0.1 to 10 microns in width and 0.3 to 30 microns in length and a coating layer formed on the surface film layer, said coating layer having been formed by coating the surface film layer with an aqueous solution of a resin composition and drying the coating solution, said coating layer containing 0.005 to 1 g/m^2 of the solid content of said aqueous solution, said resin composition comprising:

(A) 100 parts by weight of a water-soluble polymer containing tertiary or quarternary nitrogen;

(B) 5 to 75 parts by weight of a water-soluble polyaminepolyamide-epichlorohydrin adduct; and

(C) 5 to 100 parts by weight of a water-soluble polyimine compound selected from the group consisting of polyethyleneimine, poly(ethyleneimine-urea) and ethyleneimine adducts of polyaminepolyamide.

4. The coated film according to claim 1, in which the fine inorganic powder is calcium carbonate of a particle size of 0.1 to 10 microns, and the content thereof in said polyolefin layer is 10 to 200 parts by weight for 100 parts by weight of the polyolefin.

4,420,531

MAGNETIC RECORDING MEDIUM

Fuminori Tokuda, Saku, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

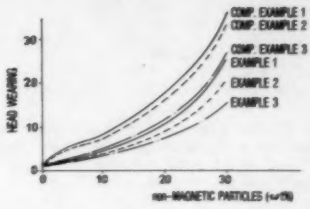
Filed Sep. 17, 1981, Ser. No. 303,288

Claims priority, application Japan, Sep. 25, 1980, 55-132343

Int. Cl.³ G11B *5/70*

U.S. Cl. 428—329 **5 Claims**

1. A magnetic recording medium composed of a base and a magnetic coating formed thereon and comprising a binder and a magnetic powder dispersed in the binder, characterized in that said magnetic powder contains a nonmagnetic powder having an average particle size of not more than 2 μm and a Mohs hardness of at least 6, in an amount of 1 to 20% on the basis of the weight of the magnetic powder, and said binder contains a dispersant resin having a functional group attached



thereto expressed by the formula —SO_3M where M is a monovalent metal.

4,420,532

MAGNETIC RECORDING MEDIUM

Nobutaka Yamaguchi; Masaaki Fujiyama, and Norio Nasu, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 31, 1982, Ser. No. 364,181

Claims priority, application Japan, Mar. 31, 1981, 56-46448

Int. Cl.³ G11B *5/70;* **B32B** *5/16*

U.S. Cl. 428—329 **6 Claims**

1. A magnetic recording medium comprising a magnetic recording layer on the surface of a non-magnetic support, in which the magnetic recording layer contains (i) a ferromagnetic powder, (ii) 1 to 10% by weight based on the weight of the ferromagnetic powder of an abrasive having a Mohs' hardness of at least 6, (iii) 5 to 50% by volume based on the volume of the ferromagnetic powder of colloidal silica and (iv) 0.1 to 2% by weight based on the weight of the ferromagnetic powder of a saturated or unsaturated fatty acid having 6 to 22 carbon atoms and 0.1 to 2% by weight based on the weight of the ferromagnetic powder of a fatty acid ester having a melting point of at most 60° C.

4,420,533

METHOD AND APPARATUS FOR COATING SUBMERGED PORTIONS OF FLOATING STRUCTURES

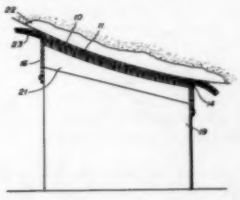
Herman S. Preiser, 2 Revell Rd., Severna Park, Md. 21146; Arthur Ticker, 12117 Maddox La., Bowie, Md. 20715, and Kenneth J. Hatley, 38 Lawrence Rd., Madison, N.J. 07940

Division of Ser. No. 131,312, Mar. 18, 1980, Pat. No. 4,321,101.

This application Oct. 23, 1981, Ser. No. 314,330

Int. Cl.³ C09J *7/02*

U.S. Cl. 428—351 **4 Claims**



1. A multilayered tape sandwich structure for use in coating those areas of a ship hull obscured by the docking block when the ship is in dry dock comprising:

a first tape for attachment to the ship hull;

an adhesive operable underwater applied to one face of the first tape for adhering said tape to the ship hull;

a second tape for attachment to the supporting surface of a docking block;

a water soluble soap means interspersed between said first tape and said second tape to provide ease of separation

and to accommodate sliding movement between said tapes; and

an adhesive means for attaching said second tape to a docking block.

4,420,534

CONDUCTIVE COMPOSITE FILAMENTS AND METHODS FOR PRODUCING SAID COMPOSITE FILAMENTS

Masao Matsui, Takatsuki; Hiroshi Naito, and Kazuo Okamoto, both of Osaka, all of Japan, assignors to Kanebo Synthetic Fibers Ltd., Osaka and Kanebo, Ltd., Tokyo, both of, Japan

Filed May 28, 1981, Ser. No. 268,026

Claims priority, application Japan, Jun. 6, 1980, 55-76901; Jun. 14, 1980, 55-80753; Jun. 19, 1980, 55-83650

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—372 **31 Claims**

1. A unitary, elongated, electrically conductive, bi-component filament which in transverse cross-section consists essentially of an electrically conductive component in the form of one or more relatively thin, elongated layers which extend transversely of the cross-section of the filament and the remainder of the filament being an electrically non-conductive component, said electrically conductive component being made of a mixture of electrically conductive metal oxide particles with at least one polymer having a crystallinity of not less than 60%, said polymer being selected from the group consisting of thermoplastic polymers and solvent-soluble polymers, said electrically non-conductive component being made of a thermoplastic fiber-forming polymer, said polymer used to form said electrically conductive component being poor in affinity to said fiber-forming polymer, at least one exposed end of each said layer being exposed on the outer surface of the filament, the opposite surfaces of each said layer being adhered to said electrically non-conductive component, the thickness of each said layer throughout substantially all of its length being at least as great as the thickness of said layer at said exposed end so as to prevent separation of said electrically conductive component from said electrically non-conductive component, said layer or layers having a specific resistance of not more than 10^7 ohm-cm, said layer or layers occupying from 1 to 40% of the total cross-sectional area of the filament and the exposed end or ends of said layer or layers occupying from 1 to 30% of the total surface area of the filament.

4,420,535

BONDABLE POLYAMIDE

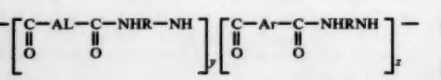
George A. Walrath, Scotia, and Scott D. Smith, Ballston, both of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Filed Oct. 14, 1981, Ser. No. 311,385

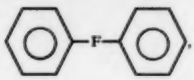
Int. Cl.³ B32B *15/00, 27/00;* H01B *7/00*

U.S. Cl. 428—379 **73 Claims**

1. A self bondable insulated wire comprising a conductor and an insulating layer of a copolyamide having the recurring unit



where AL is the divalent hydrocarbon residue of an unsubstituted aliphatic dicarboxylic acid having at least 6 carbon atoms, R is tolylene, phenylene,



where F is O, CH_2, or SO_2 or is a cycloaliphatic hydrocarbon, Ar is p-phenylene, y is 35 to 80% of the recurring units and z is 65 to 20% of the recurring units.

4,420,536

SELF-BONDING MAGNET WIRE

Hollis S. Saunders, and Lionel J. Payette, both of Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Nov. 23, 1981, Ser. No. 324,228

Int. Cl.³ B32B *27/00;* H01B *7/00*

U.S. Cl. 428—383 **5 Claims**

1. A self-bonding magnet wire comprising an electrically conducting substrate having an electrically insulating outer coating thereon consisting essentially of a layer of a blend of nylon 612 and nylon 11 wherein the nylon 11 is present in an amount up to about 25% by weight.

4,420,537

MAGNETIC RECORDING MEDIUM HAVING COBALT ADSORBED IRON OXIDE LAYER

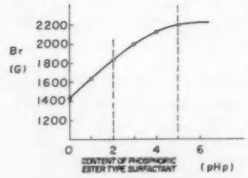
Masashi Hayama; Hiroto Saguchi, and Kenji Hirabayashi, all of Tokyo, Japan, assignors to TDK Electronics Co. Ltd., Tokyo, Japan

Filed Nov. 25, 1980, Ser. No. 210,356

Claims priority, application Japan, Nov. 28, 1979, 54-152913

Int. Cl.³ G11B *5/70;* B32B *5/16*

U.S. Cl. 428—403 **1 Claim**



1. A magnetic recording medium having a coercive force Hc of 950 to 1200 Oe and a residual magnetic flux ϕr of 0.35 to 0.6 maxwell which comprises a substrate coated with a magnetic composition comprising a cobalt adsorbed iron oxide powder, a phosphoric ester type anionic surfactant as a dispersing agent at a ratio of 2 wt.% to 5 wt.% based on said iron oxide powder, and a binder at a ratio of said iron oxide powder to said binder of 4 to 7.

4,420,538

HEAT-SENSITIVE RECORDING MATERIALS

Teruo Nakamura, Nishinomiya, and Naoto Arai, Ikeda, both of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Dec. 31, 1981, Ser. No. 336,174

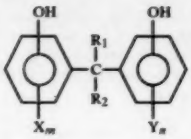
Claims priority, application Japan, Jan. 13, 1981, 56-4738

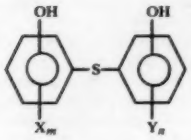
Int. Cl.³ B41M *5/18*

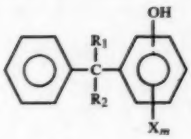
U.S. Cl. 428—411 **9 Claims**

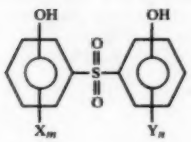
1. A heat-sensitive recording material comprising a support having a recording layer provided thereon, said recording layer containing (1) at least one colorless or pale-colored basic dye, (2) hydroquinone monobenzyl ether, and (3) at least one

compound selected from compounds represented by the formulae (I) to (IV);


(I)


(II)


(III)


(IV)

wherein X and Y are each a chlorine atom, an alkyl group having 1 to 7 carbon atoms, a phenyl group or a benzyl group; m and n are each an integer of 0 to 3; and R_1 and R_2 are each a hydrogen atom, an alkyl group having 1 to 7 carbon atoms, a phenyl group or a benzyl group, or R_1 and R_2 may jointly form a cyclohexane ring.

4,420,539

PROCESS FOR PRODUCING ANTIFRICTION MATERIALS

Valery I. Kostikov, ulitsa Marii Ulyanovoi, 9 korpus 2, kv. 12, Moscow; Jury I. Koshelev, Oktyabrsky prospekt, 356, kv. 8; Vasily D. Telegin, Oktyabrsky prospekt, 306, kv. 71, both of Ljubertsy Moskovskoi oblasti; Alexandr A. Khomenko, ulitsa Perovskaya, 40, korpus 2, kv. 8, and Evgeny F. Filimonov, Frunzensky val 16 kv. 67, both of Moscow, all of U.S.S.R.

PCT No. PCT/SU80/00101, § 371 Date Jan. 26, 1982, § 102(e) Date Jan. 26, 1982, PCT Pub. No. WO81/03452, PCT Pub. Date Dec. 10, 1981

PCT Filed Jun. 9, 1980, Ser. No. 346,038

Claims priority, application U.S.S.R., Jan. 28, 1978, 2589530; France, Aug. 29, 1980, 80 18808

Int. Cl.³ B32B *9/06, 15/04;* B05D *3/00, 3/02*

U.S. Cl. 428—450 **20 Claims**

1. A process of making antifriction products, comprising the steps of:

heat treating a siliconized graphite base consisting of about 5 to about 25% by weight of silicon; about 25 to 55 percent by weight of silicon carbide, balance carbon, to a temperature of 1500° to 2000° C. under a vacuum of 10^{-1} to 10^{-3} mm Hg and then impregnating said base with friction-resistant metals or alloys thereof.

3. The process of claim 1, wherein said heat treating is carried out for 15 to 60 minutes.

9. The process of claim 3, further including the step of machining said base after impregnation to give an article of predetermined size and shape.

10. The process of claim 9, wherein said metal is copper, gold, silver, platinum, lead, tine zinc, antimony, aluminum, bismuth or indium.

4,420,540

MAGNETIC RECORDING MEDIUM

Hiroshi Ogawa, and Yasuo Tamai, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1982, Ser. No. 431,534

Claims priority, application Japan, Nov. 6, 1981, 56-177987

Int. Cl.³ H01F *10/02*

U.S. Cl. 428—457 **7 Claims**

1. A magnetic recording medium, comprising;

a non-magnetic flexible support base, having coated thereon;

a magnetic layer comprised of a ferromagnetic powder dispersed in a binder and a branched saturated fatty acid having a melting point of 20° C. or less and having 12 or more carbon atoms.

4,420,541

RADIATION POLYMERIZABLE COMPOUNDS AND CONDUCTIVE COATINGS FROM SAME

Gregory D. Shay, Oak Forrest, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 217,873, Dec. 18, 1980, Pat. No. 4,322,331. This application Oct. 22, 1981, Ser. No. 313,876

Int. Cl.³ B32B *27/32*

U.S. Cl. 428—523 **5 Claims**

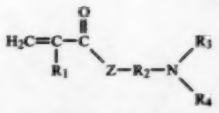
1. A process for treating a substrate to impart conductive characteristics which comprises:

(i) applying a radiation crosslinkable coating onto the surface of the substrate; and

(ii) subjecting the radiation crosslinkable coating to actinic radiation sufficient to cause crosslinking of said coating;

wherein said coating is an aqueous solution of a quaternary ammonium salt obtained by mixing reactive amounts of:

(a) at least one tertiary amine of the formula:



wherein R_1 is H or CH_3, Z is O or NH, R_2 is an aliphatic radical of from 1 to 6 carbon atoms or aryl of from 6 to 10 carbon atoms, R_3 and R_4 are the same or different and are selected from the group consisting of aliphatic radicals containing from 1 to 10 carbon atoms and aryl radicals containing from 6 to 10 carbon atoms; and

(b) at least one halide having from 2 to 6 halogen atoms and selected from the group consisting of aliphatic halides having from 1 to 10 carbon atoms and arene halides having from 7 to 20 carbon atoms.

4,420,542

ARTICLE AND METHOD FOR WOOD PRESERVATION

Edward E. Sowers, Mooresville, Ind., assignor to Reilly Tar & Chemical Corp., Indianapolis, Ind.

Filed Oct. 25, 1982, Ser. No. 436,573

Int. Cl.³ B32B *23/08;* B05D *3/02*

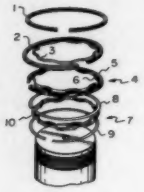
U.S. Cl. 428—541 **45 Claims**

1. A method for preserving wood, comprising the step of treating the wood with a polymer with pendant groups containing pyridine rings complexed with copper.

4,420,543
BEARING MEMBER OF AN INTERNAL COMBUSTION ENGINE, HAVING A FLAME SPRAYED SURFACE

Katsumi Kondo; Yoshio Fuwa, both of Toyota; Akira Harayama, and Toru Nakahora, both of Okaya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Teikoku Piston Ring Co., Ltd., Tokyo, both of, Japan

Filed Nov. 3, 1980, Ser. No. 203,603
Claims priority, application Japan, Nov. 9, 1979, 54-145138
Int. Cl.³ B22F *7/34, 7/08;* F16J *9/00*
U.S. Cl. 428—564 **12 Claims**



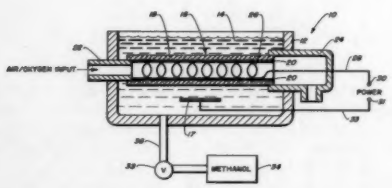
1. A bearing face coated with a flame sprayed material for use in an internal combustion engine, characterized in that the flame sprayed layer applied on the bearing face is composed of from 55 to 90% of ferrochrome and from 10 to 45% of a self-fluxing alloy.

6. A bearing face coated with a flame sprayed material for use in an internal combustion engine, characterized in that the flame sprayed layer applied on the bearing face is composed of from 55 to 85% of ferrochrome, from 10 to 30% of self-fluxing alloy, and from 5 to 15% of molybdenum.

4,420,544
HIGH PERFORMANCE METHANOL-OXYGEN FUEL CELL WITH HOLLOW FIBER ELECTRODE

Daniel D. Lawson, Arcadia, and John D. Ingham, La Crescenta, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Oct. 2, 1981, Ser. No. 307,848
Int. Cl.³ H01M *8/00*
U.S. Cl. 429—13 **19 Claims**



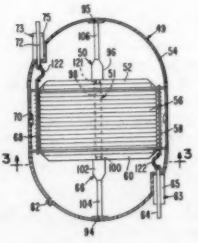
1. A fuel cell comprising:
a cell enclosure forming a chamber for containing a body of aqueous electrolyte;
an inlet connected to the chamber;
a gas-impermeable, ion-permeable tubular electrode formed of a fine filamentary, synthetic resin hollow fiber having ion exchange functionally disposed within said chamber, said electrode having a gas inlet end and a gas outlet end, a gas permeable layer of catalytic metal deposited on the inside surface thereof and a high surface area first current collector in contact with the catalytic deposit,
a second current collector disposed within the chamber so as to be immersed in said body of electrolyte, when present;
means for supplying a flow of gaseous oxidant to said gas inlet end;
a source of water-soluble electrochemically active liquid fuel;
means connecting said source to said inlet for supplying said water soluble electrochemically active liquid fuel to the chamber for containing the body of aqueous electrolyte whereby said liquid fuel and electrolyte form a liquid anode for oxidizing said fuel at said second current collector and the oxidant gas is simultaneously reduced at the first current collector developing an electrochemical potential between the second current collector and the first current collector;
and
means connected to said first and second current collectors for extracting electrical energy from the cell.

13. A method of electrochemically generating electrical energy in a fuel cell comprising the steps of:
immersing in aqueous electrolyte a gas-impermeable, ion-impermeable tubular electrode in the form of a fine, filamentary, synthetic resin hollow fiber having ion exchange functionality and having a gas permeable layer of catalytic metal deposited on the inside surface thereof and having a high surface area first current collector in contact with the metal layer;
immersing a second current collector in said aqueous electrolyte;
flowing a oxidant gas through said electrode while
flowing a water soluble electrochemically active liquid fuel into said aqueous electrolyte;
reducing said oxidant at said first current collector and oxidizing said fuel at said second current collectors to produce electrical energy; and
extracting said energy from said first current collector and second collectors.

4,420,545
LIGHTWEIGHT METAL-GAS BATTERY

Theodore O. Meyer, Sunnyvale, and Thomas E. Hickman, Cupertino, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Nov. 5, 1981, Ser. No. 318,512
Int. Cl.³ H01M *2/30*
U.S. Cl. 429—101 **13 Claims**



1. A pressurized metal-gas battery comprising:
an enclosed pressure vessel containing a stack of substantially flat electrodes, a reactant gas, and an electrolyte;
a substantially flat non-conductive end plate placed on each of two ends of said stack, said end plates sandwiching said stack therebetween;
a generally cylindrical non-conductive center rod passing through the centers of said stack and end plates, said rod aligned with the major axis of said pressure vessel;
wherein said end plates and center rod exert pressure against the inner wall of said vessel but are not bonded thereto, so that the electrode stack is mechanically supported and is not significantly disrupted by changes in size of the pressure vessel during cycling of the battery.

4,420,546

MEMBER FOR ELECTROPHOTOGRAPHY WITH A-SI AND C-SI LAYERS

Junichiro Kanbe, Yokohama, and Tadaji Fukuda, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1981, Ser. No. 294,434
Claims priority, application Japan, Aug. 29, 1980, 55-120270
Int. Cl.³ G03G 5/082, 5/14
U.S. Cl. 430—57 9 Claims

1. An electrophotographic image forming member which comprises:
(a) a substrate for use in an electrophotographic process, and
(b) a photoconductive layer constructed with (i) a crystalline silicon layer from 100 Å to 1 micron in thickness overlying said substrate, and (ii) an amorphous layer from 3 to 100 microns in thickness overlying said crystalline silicon layer, wherein said amorphous layer consists essentially of an amorphous material containing silicon atom as a matrix and a member selected from the group consisting of hydrogen atom in amounts from 1 to 40 atomic percent, halogen atom in amounts from 1 to 40% and a mixture of hydrogen atom and halogen atom in amounts from 1 to 40 atomic percent.

4,420,547

PHOTOSENSITIVE MEMBER FOR ELECTROPHOTOGRAPHY HAVING ULTRAVIOLET ABSORPTION LAYER

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 303,867
Claims priority, application Japan, Oct. 16, 1980, 55-143692
Int. Cl.³ G03G 5/10
U.S. Cl. 430—57 4 Claims

1. A photosensitive member for electrophotography, comprising :
a first photoconductive layer formed on a conductive layer and having a range of photoconductive response extending over a range of light rays from ultraviolet rays to visible light;
a filter layer for absorption of ultraviolet rays formed on the first photoconductive layer;
a second photoconductive layer of light transmissibility formed on the filter layer of ultraviolet absorption and being sensitive only to ultraviolet rays; and
said photosensitive member functioning to hold the charge which defines an electrostatic latent image between said first and second photoconductive layers to avoid said charge directly contacting a developer.

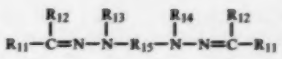
4,420,548

ELECTROPHOTOGRAPHIC MEMBER WITH HYDRAZONE OR KETAZINE COMPOUNDS

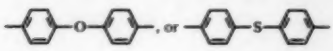
Kiyoshi Sakai, Mitaka; Minoru Mabuchi; Toshiko Suzuki, both of Tokyo; Yuji Egarashi, Hino, and Shozo Ishikawa, Sayama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,673
Claims priority, application Japan, Nov. 28, 1980, 55-166560; Jul. 23, 1981, 56-115483
Int. Cl.³ G03G 5/06, 5/14
U.S. Cl. 430—59 42 Claims

1. An electrophotographic photosensitive member characterized by having a layer containing at least one of hydrazone group compounds represented by the following formula (1) or of ketazine group compounds represented by the following formula (2):


Formula (1)

wherein R_{11} and R_{12} independently of one another are hydrogen, substituted or unsubstituted aryl, or substituted or unsubstituted heterocyclic radical; R_{13} and R_{14} independently of one another are substituted or unsubstituted alkyl, substituted or unsubstituted aralkyl, substituted heterocyclic radical; and R_{15}; is a divalent hydrocarbon radical which may be substituted, a divalent organic residue derived from a heterocyclic ring which may be substituted,



Formula (2)

wherein R_{21}, R_{22}, R_{23}, and R_{24} independently of one another are substituted or unsubstituted alkyl, substituted or unsubstituted aralkyl, or substituted or unsubstituted aryl, or R_{21} and R_{22}, together with the nitrogen which links them, is cyclic amino radical, and R_{23} and R_{24}, together with the nitrogen which links them, is cyclic amino radical.

26. An electrophotographic photosensitive member according to claim 1, wherein said layer containing at least one of hydrazone group compounds or of ketazine group compounds has a function to transport the electric charge generated in a charge generation layer.

4,420,549

LITHOGRAPHIC SUBSTRATE AND ITS PROCESS OF MANUFACTURE

Donald E. Cadwell, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 8, 1981, Ser. No. 299,721
Int. Cl.³ G03C 1/94
U.S. Cl. 430—158 7 Claims

1. An article comprising an aluminum or aluminized substrate bearing on at least one aluminum or aluminized surface thereof a ceramic coating comprising a polymeric form of aluminum phosphate or mixtures of aluminum phosphates, said coating being substantially free of particulate material, wherein a photosensitive layer is coated on said ceramic layer.

4,420,550

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING NOVEL NONDIFFUSIBLE MAGENTA DYE-RELEASING COMPOUNDS AND PRECURSORS THEREOF

Steven Evans, Rochester, and James K. Elwood, Victor, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 380,843, May 21, 1982, abandoned. This application Jan. 17, 1983, Ser. No. 458,499

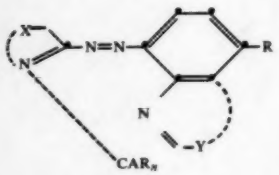
Int. Cl.³ G03C *5/54, 1/40, 1/10, 7/00*

U.S. Cl. 430—223 **44 Claims**

24. In a photographic assemblage comprising:

(i) a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material; and

(ii) a dye image-receiving layer; the improvement wherein said dye image-providing material is a nondiffusible compound capable of releasing at least one diffusible magenta dye moiety comprising a 4-(2-heterocyclylazo)phenol having a heterocyclic ring fused thereto, said compound having the formula:



wherein:

(a) X represents the atoms necessary to complete a 5- or 6-membered heterocyclic ring;

(b) Y represents the atoms necessary to complete a 5- or 6-membered heterocyclic fused ring;

(c) CAR represents a ballasted carrier moiety capable of releasing said diffusible magenta dye moiety as a function of development of said silver halide emulsion layer under alkaline conditions;

(d) R represents a hydroxy group, a salt thereof, or a hydrolyzable precursor thereof, or CAR which is linked to said dye moiety through an oxygen atom thereon; and

(e) n is 0, 1 or 2, with the proviso that when n is 0, then R is CAR which is linked to said dye moiety through an oxygen atom thereon.

4,420,551

NOVEL BENZOTRIAZINE DEVELOPERS AND PHOTOGRAPHIC PRODUCT AND METHOD

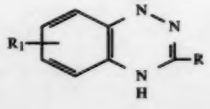
Emmett S. McCaskill, Wellesley, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 31, 1983, Ser. No. 450,373

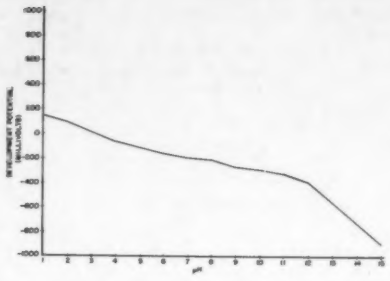
Int. Cl.³ G03C *5/54, 1/48, 5/30, 1/06*

U.S. Cl. 430—234 **8 Claims**

6. A photographic product comprising a support, a silver halide emulsion carried on said support and a developing agent in a layer on the same side of said support as said silver halide emulsion, said developing agent represented by the formula



wherein R is H, alkyl, alkoxy or aryl, R_1 is H, alkyl, $-CF_3$, $-COOH$, $-NH_2$, $-NHSO_2R_2$ or $-OR_2$, and R_2 is alkyl.



8. The product as defined in claim **6** and further including a silver halide solvent and a layer of an image receiving material.

4,420,552

METHOD OF PRODUCING PRINTED IMAGES WITH A COLOR FACSIMILE PRINTING DEVICE

Richard M. Peck, 3113 Club Dr., Allentown, Pa. 18103; Robert B. Reif, Grove City, and Loren R. Albrechtson, Columbus, both of Ohio, assignors to Richard M. Peck, Allentown, Pa.

Division of Ser. No. 244,523, Mar. 16, 1981, Pat. No. 4,390,614. This application Jan. 25, 1983, Ser. No. 460,720

Int. Cl.³ G03C *11/12, 1/40*

U.S. Cl. 430—252 **16 Claims**

1. A method of producing printed images comprising the steps of (1) exposing a printing device to radiation, said printing device comprising a printing element and a transparent photosensitive ink wherein said printing element comprises pores having openings at a printing surface of said element and said ink is disposed within said pores and is restricted from lateral movement within the element, (2) developing said photosensitive ink, and (3) transferring said ink to a substrate.

4,420,553

PHOTOSENSITIVE RECORDING MATERIAL AND PHOTOGRAPHIC PROCESSES WHEREIN SAID MATERIAL IS USED

Jan F. Van Besauw, Mortsel; Luc H. Leenders, Tielen; Dirk M. D'hont, Mortsel; Hendrik E. Kokelenberg, Merksem, and Rafaël P. Samijn, Wilrijk, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed May 10, 1982, Ser. No. 376,596

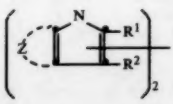
Claims priority, application United Kingdom, May 15, 1981, 8114926

Int. Cl.³ G03C *1/52, 1/68*

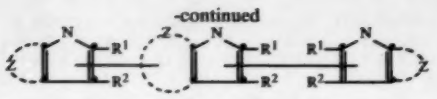
U.S. Cl. 430—275 **7 Claims**

1. A photosensitive recording material comprising a supported or self-supporting binder layer incorporating an organic photoradical precursor compound in operative relationship with an image-forming precursor compound which is capable of taking part in image formation by reaction with photoradicals formed by photoexposing said photoradical precursor compound, characterized in that

(1) the photoradical precursor compound is a di- or tri(2,3-aryl substituted indolyl) compound free from Zerewitinoff active hydrogen, and is within the scope of the following general formulae:



-continued



wherein:

Z represents the atoms necessary to close an adjacent carbocyclic aromatic ring, and

each of R^1 and R^2 is an aryl substituent or a substituted aryl substituent, the positions of the double bonds in the indole rings being determined by the position of the linkage between the rings, and

(2) the image-forming precursor compound is selected from the group consisting of (a) a reducing compound containing Zerewitinoff active hydrogen and (b) a free radical polymerizable non-gaseous ethylenically unsaturated compound in combination with a free radical producing electron-donor agent.

4,420,554

SILVER HALIDE PHOTOSENSITIVE MATERIALS

Minoru Ohashi; Kiyoshi Futaki, and Katsuaki Iwaosa, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

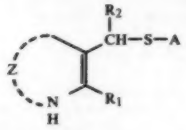
Filed Feb. 17, 1982, Ser. No. 349,525

Claims priority, application Japan, Feb. 17, 1981, 56-21764; Feb. 18, 1981, 56-21425

Int. Cl.³ G03C *1/34*

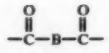
U.S. Cl. 430—446 **10 Claims**

1. In a silver halide photographic photosensitive material which comprises a support and photographic layers provided thereon, the improvement which comprises including in at least one of silver halide emulsion layers and colloid layers permeable to water through to or out from said emulsion layer at least one development fog inhibiting compound represented by the following general formula (I):

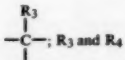


(I)

wherein A represents the heterocyclic group of a mercapto-antifoggan[e]; Z represents a diacyl group of the formula



or an atomic group necessary to form an indole ring; R_1 represents a hydrogen atom, alkyl group, phenyl group, carboxyl group or alkoxycarbonyl group; R_2 represents a hydrogen atom, alkyl group or phenyl group; B represents a methylene group of the formula



; R_3 and R_4

each represents a hydrogen atom or alkyl group; and the positions from 4 to 7 of the indole ring may be substituted with a halogen atom, alkyl group, phenyl group, alkoxy group, hydroxyl group, nitro group, carboxyl group or alkoxycarbonyl group.

4,420,555

PHOTOGRAPHIC MATERIALS CONTAINING YELLOW FILTER DYES

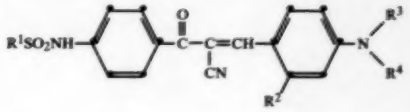
Spencer M. Krueger, Beaverton, Oreg., and James W. Brown, III, Spencerport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 19, 1982, Ser. No. 399,405

Int. Cl.³ G03C *1/00*

U.S. Cl. 430—507 **10 Claims**

1. In a photographic element comprising a support, a silver halide emulsion layer sensitive to a region of the visible spectrum in addition to the blue region, and a yellow filter layer between the silver halide emulsion layer and the intended source of exposure, the improvement wherein the yellow filter layer comprises a yellow dye represented by the structural formula:

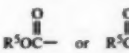


where:

R^1 is alkyl of 1 to 3 carbon atoms;

R^2 is hydrogen or alkyl of 1 to 3 carbon atoms;

R^3 and R^4 each individually alkyl of 1 to 3 carbon atoms, at least one of which is terminated with



and

R^5 is alkyl of 1 to 3 carbon atoms or fluoroalkyl of 1 to 3 carbon atoms.

4,420,556

PHOTOGRAPHIC SILVER HALIDE MATERIALS

Robert E. Booms, Rochester, N.Y., and Colin Holstead, Hertfordshire, England, assignors to Eastman Kodak Company, Rochester, N.Y.

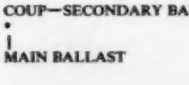
Filed Sep. 10, 1981, Ser. No. 300,713

Claims priority, application United Kingdom, Sep. 11, 1980, 8029467

Int. Cl.³ G03C *1/40*

U.S. Cl. 430—549 **14 Claims**

1. A silver halide photographic element comprising at least one silver halide emulsion layer and nondiffusible dye-forming couplers associated with the layer or layers wherein the nondiffusible dye-forming couplers comprise a first nondiffusible dye-forming coupler which, upon reaction with oxidized color developing agent, yields a nondiffusible first dye and a second, different, nondiffusible dye-forming coupler which, upon reaction with oxidized color developing agent, yields a second dye of such mobility that said second dye in combination with said first dye produces controlled image smearing in said photographic element, said second coupler yielding a dye of limited mobility and having the structure:



wherein:

COUP is a dye-forming coupler moiety, the asterisk (*) denoting the coupling position thereof;

MAIN BALLAST is a group, attached to the coupling position of COUP and detachable therefrom by means of reaction of COUP with oxidized color developing agent,

which is of such size and configuration as to render the coupler nondiffusible; and

SECONDARY BALLAST is a group, attached to a non-coupling position of COUP, which is of such size and configuration that the dye formed by coupling of COUP with oxidized color developing agent is slightly mobile.

2. A silver halide photographic element comprising at least one silver halide emulsion layer and nondiffusible dye-forming couplers associated with the layer or layers wherein the nondiffusible dye-forming couplers comprise a first nondiffusible dye-forming coupler which, upon reaction with oxidized color developing agent, yields a nondiffusible first dye and a second, different, nondiffusible dye-forming coupler which, upon reaction with oxidized color developing agent, yields a second dye of such mobility that said second dye in combination with said first dye produces controlled image smearing in said photographic element, said second coupler yielding a diffusible dye and having the structure:

COUP is a dye-forming coupler moiety, the asterisk (*) denoting the coupling position thereof;

BALLAST is a group, attached to the coupling position of COUP and detachable therefrom by means of reaction of COUP with oxidized color developing agent, which is of such size and configuration as to render the coupler nondiffusible; and

SOL is a solubilizing substituent, attached to a non-coupling position of COUP, which renders the dye formed by coupling of COUP with oxidized color developing agent diffusible in the alkaline environment present during photographic processing and, associated with the layer containing the second coupler, a mordant which immobilizes the diffusible dye.

4,420,557

COLOR PHOTOGRAPHIC RECORDING MATERIAL CONTAINING A NON-DIFFUSIBLE ELECTRON DONOR PRECURSOR COMPOUND

Heinrich Odenwälder, and Paul Marx, both of Leverkusen, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

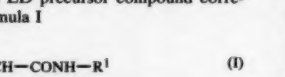
Filed Oct. 25, 1982, Ser. No. 436,581

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3144037

Int. Cl.³ G03C *1/40, 1/48, 1/06, 5/30*

U.S. Cl. 430—559 **5 Claims**

1. A color photographic recording material comprising at least one light-sensitive silver halide emulsion layer and associated thereto a non-diffusing color-providing compound, which material contains, in at least one light-sensitive silver halide emulsion layer or in a non-light-sensitive binder layer, a non-diffusing electron donor precursor compound (ED precursor compound), from which a non-diffusing ED compound is formed under alkaline development conditions, wherein the improvement comprises the ED precursor compound corresponds to the following formula I



wherein

R^1 represents a carbocyclic or heterocyclic aromatic group,

R^2 represents hydrogen, alkyl, alkenyl, aryl or acyl; and at least one of the radicals R^1 and R^2 contains a ballast radical.

4,420,558

BRIGHT FIELD LIGHT MICROSCOPIC METHOD OF ENUMERATING AND CHARACTERIZING SUBTYPES OF WHITE BLOOD CELLS AND THEIR PRECURSORS

Jan R. De Mey, Turnhout, and Marc K. J. J. Moeremans, Mol, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 233,809, Feb. 12, 1981, abandoned. This application Oct. 29, 1981, Ser. No. 316,204

Int. Cl.³ G01N *33/48, 33/52, 33/54*

U.S. Cl. 435—7 **19 Claims**

1. A bright field light microscopic ethod for the quantitative determination and characterization of white blood cells and precursors thereof, which comprises the steps of

(i) labeling viable cells of the desired subtype by allowing them to react first with specific non-labeled antibodies and thereafter with appropriate gold-labeled secondary antibodies, whereby the cells are, until fixation, allowed to undergo extensive patching of the antigens, but are prevented from capping and all forms of internalization by keeping them in contact with an effective concentration of an appropriate inhibitor of oxidative phosphorylation;

(ii) fixing the cells and staining the cells with endogenous peroxidase activity by contacting them with an appropriate peroxidase-indicator; and

(iii) counting and identifying the gold-labeled cells in a given sample under the bright field light microscope.

4,420,559

METHOD OF ENZYMATICALLY CONVERTING A SUBSTRATE USING MEMBRANE VESICLES

Ulrich Zimmermann, Jülich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 248,318, Mar. 27, 1981, abandoned, which is a continuation of Ser. No. 61,517, Jul. 27, 1979, abandoned, which is a continuation of Ser. No. 871,217, Jan. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 688,918, May 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 472,472, May 22, 1974, abandoned. This application Dec. 10, 1982, Ser. No. 448,721

Claims priority, application Fed. Rep. of Germany, May 23, 1973, 2326161

Int. Cl.³ C12P *19/14*

U.S. Cl. 435—99 **5 Claims**

1. A method for enzymatically converting a substrate in an aqueous solution using an enzyme entrapped in membrane vesicles and suspended in the solution, the method comprising the steps of:

suspending erythrocytes in a first aqueous solution having an osmolarity which is less than 70% of the content of the erythrocytes said solution containing at least 0.5 mM/l of ions selected from the group consisting of magnesium, calcium and potassium ions; and low enough to increase the permeability of the membrane of the erythrocytes;

leaving said erythrocytes in said first aqueous solution until osmotic equilibrium is reached between the contents of said erythrocytes and said first solution, thereby producing membrane vesicles from said erythrocytes and loading said membrane vesicles with an enzyme;

adding to said first solution containing said enzyme loaded membrane vesicles osmotically active substances selected from the group consisting of calcium, potassium, and sodium ions to increase the osmolarity of the first solution thereby reducing said permeability of the membrane of the membrane vesicles entrapping the enzymes therein;

separating said loaded membrane vesicles from said first aqueous solution;

suspending said loaded membrane vesicles in a second aqueous solution having an osmolarity up to 20% less than the osmolarity of said loaded membrane vesicle, said second aqueous solution containing the substrate to be degraded;

holding said loaded membrane vesicles in said second aque-

ous solution for a period of time sufficient to allow the substrate to enter said membrane vesicles and be degraded by said enzyme and to produce reaction products which reaction products leave said membrane vesicles and accumulate in said second aqueous solution; and

separating said loaded membrane vesicles from said reaction products.

4,420,560

METHOD FOR MODIFICATION OF FATS AND OILS

Takaharu Matsuo, Sennan; Norio Sawamura, Osaka; Yukio Hashimoto, Kishiwada, and Wataru Hashida, Osaka, all of Japan, assignors to Fuji Oil Company, Limited, Japan

Filed Nov. 17, 1981, Ser. No. 322,248
Int. Cl.³ C12P 7/64
U.S. Cl. 435—134 10 Claims

1. In a method for the modification of a fat or oil by selectively transesterifying:

a mixture, designated as mixture A, which mixture comprises: a glyceride-type fat or oil to be modified, designated as material A and a fatty acid or a monohydric alcohol ester thereof, designated as material B,

in the presence of an enzyme catalyst having a selective transesterification activity, designated as catalyst A; and

recovering the modified fat or oil designated as resultant A, fatty acid or monohydric alcohol ester thereof reaction residues, designated as resultant B and enzyme catalyst, designated as catalyst B, from the reaction mixture; and

then producing a hard butter from the resultant A,

the improvement which comprises hydrogenating a part or all the resultant B and reusing the thus hydrogenated product, designated as material C, as a part of the mixture A.

4,420,561

FERMENTATION PROCESS

Nai Y. Chen, Titusville, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,461
Int. Cl.³ C12P 7/06
U.S. Cl. 435—161 10 Claims

1. In an ethanol fermentation process in which an aqueous solution of fermentable sugar is converted by an ethanol-producing microorganism to carbon dioxide and a dilute aqueous solution of ethanol with the ethanol being present in the solution at a concentration which does not exceed a predetermined maximum level, said predetermined maximum level of ethanol being selected to be that which is below the level of ethanol causing fermentation to substantially cease, the improvement comprising selectively sorbing ethanol present in the solution during fermentation within a hydrophobic crystalline aluminosilicate ZSM-5 or HZSM-5 zeolite possessing a silica to alumina ratio of greater than about 12 so that the non-sorbed ethanol present in the solution does not exceed the predetermined maximum level of concentration therein, and thereafter desorbing sorbed ethanol from the zeolite by stripping said zeolite with the carbon dioxide obtained from the ethanol fermentation process.

4,420,562

METHOD FOR PRODUCING CREATINASE

Shigeru Ikuta; Kazuo Matsuura, and Hideo Misaki, all of Shizuoka, Japan, assignors to Toyo Jozo Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 338,607, Jan. 11, 1982, abandoned, which is a continuation-in-part of Ser. No. 158,800, Jun. 12, 1980, abandoned. This application Apr. 23, 1982, Ser. No. 371,458
Claims priority, application Japan, Jul. 4, 1979, 54-85260
Int. Cl.³ C12N 9/78; C12R 1/07
U.S. Cl. 435—227 3 Claims

1. A method for producing and isolating creatinase which comprises culturing a creatinase producing microorganism Bacillus sp. B-0618, Firm-P No. 4049, fractionally eluting sarcosine oxidase and creatinase by anion exchange chromatography from the sarcosine oxidase- and creatinase-containing solution thus produced to obtain a creatinase eluted fraction and collecting creatinase therefrom.

4,420,563

PROCESS FOR THE PRODUCTION OF OSMOTOLERANT YEAST

Shao L. Chen, and Feliks Gutmanis, both of Milwaukee, Wis., assignors to Universal Foods Corporation, Milwaukee, Wis.

Continuation of Ser. No. 140,262, Apr. 14, 1980, abandoned. This application Jun. 17, 1982, Ser. No. 389,321
Int. Cl.³ C12N 1/36
U.S. Cl. 435—245 14 Claims

1. In a process for producing an osmotolerant baker's yeast by propagating yeast in a series of stages and harvesting yeast from the last stage, the improvement which comprises:

(a) incrementally feeding nutrient containing water-soluble, ionic, non-nutritive salts to all of the highly aerobic yeast propagative stages except the last stage, said nutrient containing said non-nutritive salts in amounts sufficient to provide a final total ionic concentration of said non-nutritive salts in each of said stages of at least between about 1 and 2% on a weight-/volume basis when yeast growth is completed in each of said storage;

(b) incrementally feeding nutrient containing water-soluble, ionic, non-nutritive salts to the last propagative stage of the yeast produced in the preceding stages wherein the said salt in said nutrient is supplemented with additional non-nutritive, ionizable, water-soluble salt in amounts sufficient to provide a final total ionic concentration of said non-nutritive salts in said last stage of at least 2.5% on a weight/volume basis when the yeast growth in said last stage is complete; and

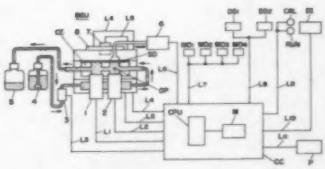
(c) harvesting the resulting osmotolerant yeast from the said last stage.

4,420,564

BLOOD SUGAR ANALYZER HAVING FIXED ENZYME MEMBRANE SENSOR

Nobuhiko Tsuji; Keijiroh Nakamura, both of Yokosuka; Koichi Endoh, Hino; Toshiyoshi Hamada, and Keiichi Ishida, both of Tokyo, all of Japan, assignors to Fuji Electric Company, Ltd., Kawasaki, Japan

Filed Nov. 4, 1981, Ser. No. 318,000
Claims priority, application Japan, Nov. 21, 1980, 55-163334; Nov. 21, 1980, 55-163335; Dec. 9, 1980, 55-172658; Dec. 9, 1980, 55-172659; Dec. 9, 1980, 55-172661; Dec. 9, 1980, 55-172662; Dec. 9, 1980, 55-172663
Int. Cl.³ G01N 33/66
U.S. Cl. 435—288 15 Claims



1. A blood sugar analyzing apparatus having a reaction cell which houses a fixed enzyme membrane sensor and a measuring electrode and which receives a blood specimen, said fixed enzyme membrane sensor measuring the blood sugar concentration in the blood specimen as a function of a reaction current signal generated in the sensor by the chemical reaction, and

means for calculating a reaction current offset for adjusting the measured reaction current value to more accurately detect the actual blood sugar concentration by subtracting said offset from said measured reaction current value; and said apparatus having monitoring means for sensing a plurality of operational values including reaction cell current, reaction cell temperature and reaction current offset, to compare said sensed values with predetermined corresponding ranges, and to display an error signal when at least one of said values exceeds it corresponding range, to thereby provide information concerning operation conditions and maintenance needs to an operator.

4,420,565
METHOD FOR DETERMINING FLOW PATTERNS IN SUBTERRANEAN PETROLEUM AND MINERAL CONTAINING FORMATIONS

Kirk D. Schmitt, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 221,692, Dec. 31, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,544

Int. Cl.³ G01N *33/24, 31/08*

U.S. Cl. 436—27 **8 Claims**

1. The method for determining flow patterns within a subterranean formation penetrated by a spaced apart injection system and production system, said method comprising injecting into the formation at a predetermined depth in the injection system a solution containing a tracer compound present in sufficient quantity for identification, recovering said solution containing tracer compound in the production system, determining the depth of recovery, and identifying said tracer compounds by gas chromatography and flame ionization detector; said tracer being a volatile water-soluble organic compound containing a hydrocarbon moeity and phosphorus.

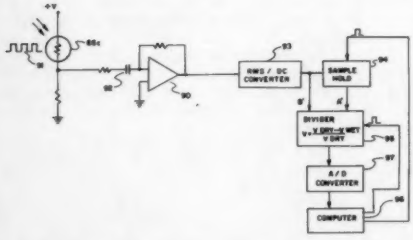
4,420,566
METHOD AND APPARATUS FOR DETECTING SAMPLE FLUID ON AN ANALYSIS SLIDE

Thomas C. Jessop, Webster, and Donald De Jager, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 10, 1982, Ser. No. 387,124

Int. Cl.³ G01N *35/00, 35/06, 21/00, 33/18*

U.S. Cl. 436—46 **20 Claims**



1. Apparatus for detecting a sample fluid containing a substantial portion of water on a test element adapted to receive a predetermined quantity of the sample fluid from a metering device and to produce a response proportional to a selected analyte in the fluid, an element being of a type for the selected analyte and having certain reflectance characteristics, said apparatus comprising:

means for projecting a beam of radiation comprising wavelengths absorbed by water onto a surface of a test element;

sensor means for detecting the intensity of radiation within the absorption band of water reflected from a surface of a test element and for producing an output proportional to said intensity, said sensor means being adapted to produce a first output from radiation received before fluid is metered onto an element and a second output after fluid is metered thereon; and

means for processing said outputs, said processing means including means for receiving an input indicative of the reflectance characteristics of said type of test element and for comparing the difference between said first and second outputs with a predetermined value which corresponds to a sufficient amount of fluid on said type of test element, and means for producing a signal in the event the amount of fluid is not sufficient to produce a proper response.

10. A method for detecting a sample fluid containing a substantial portion of water on an analysis slide, said slide being adapted to receive a predetermined quantity of sample fluid and to produce a response proportional to a selected analyte in the fluid, said slide being selected from more than one type, each type being for a particular analyte and having a defined range of values of reflectivity which varies between a relatively high reflectivity when the slide does not contain any fluid and a relatively low reflectivity after fluid has been deposited on the slide, said method comprising the steps of:

(a) projecting radiation comprising wavelengths absorbed by water onto a dry slide before the metering of fluid thereon;

(b) detecting the intensity of radiation within the absorption band of water reflected from said dry slide;

(c) projecting radiation comprising wavelengths absorbed by water onto said slide after the metering of fluid thereon;

(d) detecting the intensity of radiation within the absorption band of water reflected from said slide after the metering of fluid onto the slide;

(e) comparing the difference between the intensity of radiation reflected from said dry slide and from said slide after fluid has been metered thereon with a predetermined value within the reflectivity range of the type of slide suitable for said selected analyte to determine if sufficient fluid has been metered onto the slide to produce a proper response; and

(f) producing a signal in the event the amount of fluid is not sufficient for a proper response.

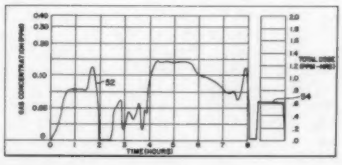
4,420,567
HYDRIDE GAS DETECTING TAPE

Roberta McMahon, Chicago, and Franco F. Fiorese, Elmhurst, both of Ill., assignors to MDA Scientific, Inc., Glenview, Ill.

Filed Oct. 22, 1981, Ser. No. 313,651

Int. Cl.³ G01N *31/08*

U.S. Cl. 436—169 **11 Claims**



1. A substrate for detecting hydride gases comprising a solid absorbent material and a detector composition impregnating the absorbent material, said detector composition consisting essentially of silver nitrate, an organic or inorganic acid to stabilize the silver nitrate and a glycol to maintain the substrate in a moist condition whereby the substrate is capable of reaction with a hydride gas for the development of color as a measure of the hydride concentration.

8. A method for detecting hydride gases comprising:

(a) contacting a hydride-containing gas with a substrate for detecting hydride gases comprising a solid absorbent material impregnated with a detector composition, said detector composition consisting essentially of silver nitrate, an organic or inorganic acid to stabilize the silver nitrate and a glycol to maintain the substrate in a moist condition whereby the substrate is capable of reaction

with a hydride-containing gas for the development of color;

(b) sampling said hydride-containing gas over a given period of time by allowing diffusion of said gas onto the porous member to produce the detectable color; and

(c) determining the intensity of the color as a measure of the concentration of hydride gases in the atmosphere.

4,420,568

FLUORESCENT POLARIZATION IMMUNOASSAY UTILIZING SUBSTITUTED TRIAZINYLAMINOFLUORESCEINS

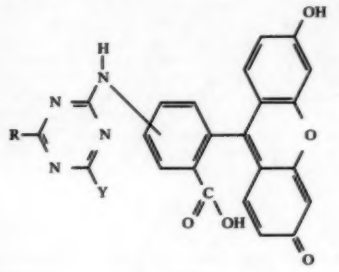
Chao-Huei J. Wang, Gurnee; Stephen D. Stroupe, Libertyville, and Michael E. Jolley, Round Lake, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 173,553, Jul. 30, 1980, abandoned. This application Nov. 30, 1981, Ser. No. 325,872

Int. Cl.³ G01N *33/54, 33/58, 33/52, 33/74*

U.S. Cl. 436—536 34 Claims

1. A method for determining ligands in a sample comprising intermixing with said sample a biologically acceptable salt of a tracer of the formula:



wherein

Y is halo or lower alkyl; and

R is a ligand-analog wherein said ligand-analog has at least one common epitope with said ligand so as to be specifically recognizable by a common antibody;

and an antibody capable of specifically recognizing said ligand and said tracer; and then determining the amount of tracer bound to antibody by fluorescence polarization techniques as a measure of the amount of ligand in the sample.

4,420,569

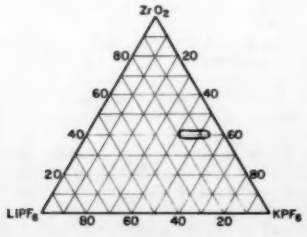
ALKALI METAL ZIRCONOFLUOROPHOSPHATE GLASSES

Paul A. Tick, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 11, 1983, Ser. No. 483,898

Int. Cl.³ C03C *1/00, 3/18*

U.S. Cl. 501—30 3 Claims



1. A transparent glass having a refractive index in the vicinity of 1.45, a density in the area of 3.1 g/cm³, an electrical resistivity on the order of 10^9 ohm-cm, and a transition temperature below 200° C. having a batch composition within the Li_2O-K_2O-ZrO_2-F-P_2O_5 system as generally depicted in terms of mole percent in FIG. 2.

3. A transparent glass according to claim 1 having a stoichiometry, on a chemically analyzed basis, of about $Zr_{3.2}P_{1.2}(Li+K)_{5.6}F_{15.7}O_{5.1}$.

4,420,570

REACTION INJECTION MOLDED ELASTOMER CONTAINING AN INTERNAL MOLD RELEASE MADE BY A TWO-STREAM SYSTEM

Richard J. G. Dominguez, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,260

Int. Cl.³ C12P *13/16, 17/04*

U.S. Cl. 521—112 9 Claims

1. A method for making a reaction injection molded elastomer which will release from its mold with reduced frequency of application of external mold release agents comprising injecting exactly two streams via a RIM machine into a mold cavity of the desired configuration, a formulation comprising in the first stream a high molecular weight polyhydric polyether, a low molecular weight active hydrogen containing compound of at least two functionality and an internal mold release agent, and in the second stream an aromatic polyisocyanate and tin catalyst in an amount equal to 100% of the tin catalyst present in the formulation.

5. A method as in claim 1 where the internal mold release agent comprises a dimethyl siloxane with organic acid groups.

4,420,571

PHENOLIC FRICTION PARTICLES

John R. Blickensderfer, and Luba A. Pacala, both of Belle Mead, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 141,142, Apr. 17, 1980, abandoned. This application Jul. 13, 1982, Ser. No. 397,896

Int. Cl.³ C08J *5/14;* C08L *5/00, 61/06*

U.S. Cl. 523—149 20 Claims

1. In a process for the production of substantially completely cured resin friction particles the essential steps of:

(A) reacting, in an aqueous medium at a temperature of from about 50° C. to about 100° C., (I) a mixture of phenols, said mixture comprised of from 25 to 100 mole percent of tri-and/or tetrafunctional phenols and from 0 to 75 mole percent of difunctional phenols; (II) from 1.1 to 3 moles per mole of phenol moiety of an aldehyde containing from 1 to 11 carbon atoms, (III) from 0.01 to 1 mole per mole of phenol moiety of a reaction promoting compound chosen from the group of alkali and alkaline earth hydroxides and oxides and the primary, secondary and tertiary amines having up to 10 carbon atoms and (IV) from 0.05 to 6 weight percent of a protective colloid based on the weight of compounds (I), (II) and (III); for a period of time such that a particulate, heat reactive, and substantially water-insoluble phenol resin is formed which is dispersed in said aqueous medium;

(B) adding an acid compound to the aqueous dispersion of step (A) in an amount such that the pH of the aqueous dispersion is from 0 to 4, and substantially completely curing the resin particles, and

(C) separating the resin particles from the aqueous medium.

4,420,572

CONTINUOUS PROCESS FOR THE PRODUCTION OF HIGHLY CONCENTRATED SPINNING SOLUTIONS OF ACRYLONITRILE POLYMERS AND A SUITABLE DEVICE FOR THIS PURPOSE

Ernst Höroldt; Helmut Vollmüller, both of Kelkheim; Heinz D. Bernhard, St. Goar, and Harald M. Strobel, Flörsheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 331,805

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3048059

Int. Cl.³ C08J *3/08*

U.S. Cl. 523—322 3 Claims

1. A continuous process for the production of highly concentrated spinning solutions from acrylonitrile polymers, which consists essentially of dissolving in one step in a stirred mixing vessel, which contains, as the stirrer, only one disc-shaped stirrer rotating in a horizontal plane, the peripheral velocity of which stirrer can be controlled from about 4 to about 25 m/sec, this peripheral velocity being sufficient to stir vigorously, with the formation of a vortex, the solution contained in the stirred mixing vessel, metering in, separately and at room temperature, the polymer to be dissolved and the solvent into the vortex, discharging continuously the finished spinning solution at the bottom of the stirred mixing vessel at such a rate that the liquid level in the vessel is maintained at a constant value, and maintaining the temperature of the solution in the vessel at a constant preset value in the range from about 60 to about 120° C. by controlling the peripheral velocity of the stirrer, the average residence time of the polymer in the vessel being about 5 to 30 minutes.

4,420,573

METHOD OF TREATING WATER-IN-OIL DISPERSIONS

Sidney G. Fogg, Ashtead; Frank C. Robertson, Woking, and Douglas Wilson, Godalming, all of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Mar. 17, 1982, Ser. No. 359,054

Claims priority, application United Kingdom, Mar. 28, 1981, 8109803; Oct. 24, 1981, 8132137

Int. Cl.³ C02B *9/02*

U.S. Cl. 523—333 12 Claims

1. A method of treating a dispersion of salt water-in-oil comprising mixing the dispersion with a latex of rubber having a high wet gel strength, said dispersion containing oil as the continuous phase and water as the dispersed phase in an amount of 20 to 80% by volume.

4,420,574

UNGELLED POLYEPOXIDE-POLYOXYALKYLENEPOLYAMINE RESINS, AQUEOUS DISPERSIONS THEREOF, AND THEIR USE IN CATIONIC ELECTRODEPOSITION

Thomas C. Moriarity, Allison Park, and William J. Geiger, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 284,865, Jul. 20, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 420,551

Int. Cl.³ C08L *63/02*

U.S. Cl. 523—404 9 Claims

1. An aqueous resinous dispersion which contains from:

(A) 0.5 to 40 percent by weight of an ungelled resin formed from reacting:

(i) a polyepoxide with

(ii) a polyoxyalkylenepolyamine; the ratio of equivalents of active hydrogens in (ii), with primary amine groups being considered monofunctional, to equivalents of epoxy in (i) being within the range of 1.20 to 1.70:1, the reaction product being at least partially neutralized with acid to provide cationic groups,

(B) 60 to 99.5 percent by weight of an additional cationic resin different from (A) and which is electrodepositable on a cathode; the percentages by weight being based on total weight of (A) plus (B).

4,420,575

WATER REDUCIBLE AEROSOL PAINTS

Stanley Rapaport, Shaker Heights, and Francis J. Cachat, Rocky River, both of Ohio, assignors to Plasti-Kote Company, Inc., Medina, Ohio

Filed Jul. 26, 1982, Ser. No. 401,838

Int. Cl.³ C09D *3/66, 5/02*

U.S. Cl. 523—504 11 Claims

1. An aerosol paint under atomizing paint dispensing pressures characterized by a carrier water phase, a film-forming paint phase, and a liquid substantially water-miscible propellant phase in mutually compatible admixture; and polymeric, non-volatile, film-forming solids component constituting from about 5–15%, the water from about 15–40%, and said propellant about 20–40% of said aerosol paint: at least one portion of said polymeric film-forming component consisting essentially of a low molecular weight monomer modified alkyd resin of less than 6,000 units and an acid value between about 40 and 80, said acid value neutralized with an alkaline base, said base at least in part consisting of the group selected from ammonia and amines; and at least one other portion of said polymeric film-forming component consisting of an emulsion polymer latex having a molecular weight substantially greater than said alkyd, but less than 1 million; said total polymeric binder in combination in said aerosol paint with an excess of 5%, but not more than about 30% of at least one of each of the following water-miscible volatile organic solvent groups (a) low molecular weight alcohols, ketones, and esters and (b) high molecular weight glycol ethers and esters; said aerosol paint having a pH of from about 8.0 to 8.5.

4,420,576

PLASTICS BASED COMPOSITION CONTAINING A POLYESTER RESIN AND ALKALINE MODIFIED STARCH GRANULES

Gerald J. L. Griffin, London, England, assignor to Coloroll Limited, London, England

Filed Jul. 29, 1981, Ser. No. 287,913

Claims priority, application United Kingdom, Aug. 6, 1980, 8025601

Int. Cl.³ C08L *3/00, 3/04*

U.S. Cl. 524—47 2 Claims

1. A plastics-based composition comprising a polyester resin and starch granules which, prior to mixing with the resin, are rendered reactive with the resin by a surface implant of alkali metal or alkaline earth metal ions.

4,420,577

SELF-EXTINGUISHING POLYOLEFIN COMPOSITIONS

Guido Bertelli, and Renato Locatelli, both of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Apr. 27, 1982, Ser. No. 372,388

Claims priority, application Italy, Apr. 30, 1981, 21459 A/81

Int. Cl.³ C08K *5/36, 5/46, 5/47*

U.S. Cl. 524—83 3 Claims

1. Self-extinguishing polyolefinic compositions consisting of:

(1) from 52 to 96.55% by weight of an olefinic polymer or copolymer;

(2) from 3 to 30% by weight of a compound selected from the group consisting 1,3,5-triazines, urea and dicyandiamide;

(3) from 0.3 to 3% by weight of a free-radical promoting compound selected from the group consisting of: 2,3-dimethyl-2,3-diphenyl-butane and 2,3-dimethyl-2,3,diphenyl-hexane;

(4) from 0.15 to 15% by weight of a sulphur-nitrogenous compound having either one of the following two (2) general formulae:

(I)

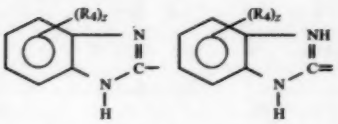
(II)

wherein:

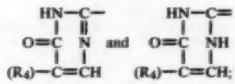
S=sulphur atom

R_1, R_2=radicals selected from the group consisting of

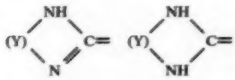
(a) imidazol, in which R_1 and R_2 are respectively of the formulae:



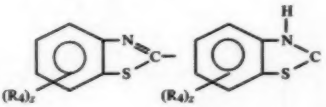
(b) uracyl, with R_1 and R_2 respectively having the formulae:



(c) alkylene urea, with R_1 and R_2 of the corresponding respective formulae:



(d) benzothiazol, with R_1 and R_2 having respectively the formulae:



R_3=H, or a metal belonging to Group II (A) or (B) of the Periodic System, or aluminum;

R_4=alkyl radical containing from 1 to 4 carbon atoms, or a halogen;

Y=an alkylene radical containing from 2 to 3 carbon atoms, or an alkylene radical containing substituent groups R_4;

n=valency of metal R_5;

z=a number comprised between 0 and 3, extremes included.

4,420,578

SURFACE TREATMENT OF GLASS CONTAINERS

Rodger G. Hagens, Hamilton, and Dominic K. Hui, Oakville, both of Canada, assignors to Diversey Corporation, Mississauga, Canada

Continuation-in-part of Ser. No. 205,091, Nov. 10, 1980, abandoned. This application Sep. 14, 1981, Ser. No. 302,303

Int. Cl.³ C08K *5/09*

U.S. Cl. 524—322 **4 Claims**

1. A composition for coating returnable glass bottles comprising about 0.5–50% by weight of an amino functional polydimethylsiloxane, about 5 to 49.9% by weight of an organic solvent, about 0.1 to 10% by weight of a nonionic surfactant, about 0–10% by weight of a quaternary surfactant and about 0–50% by weight of a fatty carboxylic acid having 10 to 22 carbon atoms or a mixture thereof, said composition containing a minimum of 0.1% quaternary surfactant or a minimum of 0.1% fatty carboxylic acid or of both.

4,420,579

ANTIOXIDANT COMPOSITIONS

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

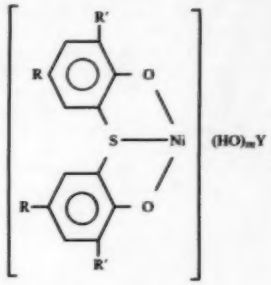
Continuation of Ser. No. 1,662, Jan. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 901,938, May 1, 1978, Pat. No. 4,198,303. This application Jan. 8, 1982, Ser. No. 338,452

The portion of the term of this patent subsequent to Apr. 15, 1997, has been disclaimed.

Int. Cl.³ C08K *5/36*

U.S. Cl. 524—328 **2 Claims**

1. A composition comprising a major proportion of a C_2–C_4 polyolefin polymer normally susceptible to oxidative degradation and a minor amount sufficient to impart antioxidant properties and/or ultra-violet or visible light stabilization thereto of an additive mixture consisting essentially of a nickel organosulfur-containing hydroxy complex having the following general structure



where each R is hydrogen or an alkyl group having from 1 to about 30 carbon atoms, each R′ is hydrogen or an alkyl group containing from 1–8 carbon atoms in any isomeric configuration except those in which a carbon atom bonded to a ring carbon atom is in turn bonded to more than two other carbon atoms, Y is an alkyl, alkylene, aralkyl, or alkylene aryl group having from 1 to about 40 carbon atoms and n is from 1 to 4 and m is from 1 to 6 with the provision that m is never less than n and a hindered phenol selected from 2,6-di-t.butyl-p-cresol, 4,4′-methylenebis-(2,6-di-t.butyl-m-cresol), 4,4′-butylidenebis-(6-t.butyl-m-cresol), 4,4′-methylenebis-(2,6-di-t-butylphenol), 2,6-di-t.butylphenol, tetrakis [methylene 3-(3′,5′-di-t.butyl-4-hydroxyphenyl) propionate] methane, 4,4′-butylidenebis-(2,6-di-t.butylphenol), 2,4,6-tri-t-butyl phenol and/or an arylamine.

4,420,580

METHOD FOR PREPARING FILLED POLYOLEFIN RESINS AND THE RESIN MADE THEREFROM

Jim T. Herman; Kenneth L. Bryce, both of Angleton, and Gerald M. Lancaster, Surfside, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 8, 1982, Ser. No. 346,806

Int. Cl.³ C08K *3/20, 326;* **C08L** *23/04;* **C08F** *20/06*

U.S. Cl. 524—424 **12 Claims**

1. A method of preparing filled polyolefin resins which consisting essentially of forming a melt of a polyolefin resin; blending into the melt an inorganic metal filler which is any polyvalent inorganic metal oxide, hydroxide or salt which reacts with the acid moiety of an ethylene-acid copolymer and a copolymer of ethylene and an alpha-, beta-ethylenically unsaturated carboxylic acid; and solidifying the resultant melt blend to form a filled polyolefin resin.

4,420,581

THERMOPLASTIC POLYESTER MOLDING COMPOSITIONS

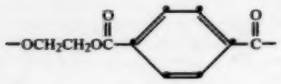
Finley E. McFarlane, and Robert B. Taylor, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 21,755, Mar. 19, 1979, Pat. No. 4,250,078. This application Jan. 28, 1981, Ser. No. 229,041

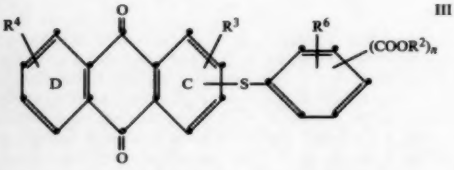
Int. Cl.³ C08K 3/22

U.S. Cl. 524—431 4 Claims

1. Polyester molding composition comprising a polymer selected from the group consisting of (a) polymers wherein at least about 97% by weight of the polymer contains the repeating ethylene terephthalate units of the formula:

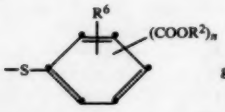


with the remainder being minor amounts of ester-forming components, and (b) copolymers of ethylene terephthalate wherein up to about 30 mole percent of the glycol is selected from one or more of diethylene glycol; propane-1,3-diol; butane-1,4-diol; polytetramethylene glycol; polyethylene glycol; polypropylene glycol and 1,4-hydroxymethylcyclohexane; and up to about 30 mole percent of the acid is selected from one or more of isophthalic; bibenzoic; naphthalene 1,4- or 2,6-dicarboxylic; adipic; sebacic; and decane-1,10-dicarboxylic acid, wherein said polymers contain a coloring amount of the copolymerized residue of one or more compounds of the formula



III

wherein either ring C or D may contain in any position thereon one or more additional



groups;

R^2 is —H or lower alkyl; n is 1 or 2; R^3, R^4 and R^6 each is hydrogen or 1–3 substituents selected from lower alkyl; lower alkyl substituted with lower alkoxy, phenyl, Cl, Br, or lower alkanoylamino; lower alkoxy; lower alkoxy substituted with lower alkoxy, phenyl, Cl, Br, or lower alkanoylamino; chlorine; bromine; amino; lower alkylamino; lower alkylamino substituted with lower alkoxy, cyclohexyl, phenyl, Cl, Br, or lower alkanoylamino; arylamino; arylthio; aroylamino; wherein each aforesaid aryl moiety is 6–10 carbons; lower alkylsulfonyl; lower alkylthio; lower alkanoylamino; and cyclohexylamino; and wherein said polymers are admixed with from about 1 to about 300 ppm of iron oxide.

4,420,582

POLYMERIC MATRICES REINFORCED WITH HIGHLY DISPERSED SYNTHETIC ZEOLITIC PARTICULATES

Pierre Canard, Versailles; Bertrand Latourrette, Le Raincy, and Gilbert Schorsch, Colombes, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jun. 9, 1981, Ser. No. 271,956

Claims priority, application France, Jun. 9, 1980, 80 12742

Int. Cl.³ C08K 3/34

U.S. Cl. 524—450 12 Claims

1. A composite article of manufacture comprising a polypropylene matrix reinforced with a reinforcing amount of synthetic zeolitic filler particulates, the mean size of the elementary particles comprising said zeolitic filler particulates being on the order of that of the secondary particles of said zeoliitic filler particulates, said zeolitic filler particulates being highly dispersed in said polypropylene matrix, said composite article of manufacture having an impact strength greater than that of the corresponding composite article of manufacture comprising unfilled polypropylene matrix.

4,420,583

ACID CONTAINING EMULSION COPOLYMER CROSSLINKED BY A HALOHYDROXYPROPYL AMMONIUM SALT SOLUTION POLYMER

Thomas W. Hutton, Doylestown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 24, 1982, Ser. No. 391,659

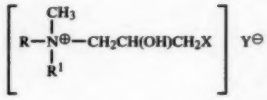
Int. Cl.³ C08J 3/02; C08K 3/20

U.S. Cl. 524—501 13 Claims

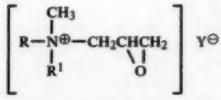
1. A composition suitable for films, coatings, binders and adhesives consisting essentially of:

A. an emulsion of a copolymer of an ethylenically unsaturated carboxylic acid and one or more comonomers, said ethylenically unsaturated acid being about 0.1 to 20% by weight of said copolymer and

B. an aqueous solution of a polymer of at least 10% by weight of one or more monomers of the formula:



or



or mixtures thereof wherein

R is an ethylenically unsaturated group;

R^1 is a linear C_1 to C_4 alkyl or hydroxyalkyl group;

X is chlorine, bromine, or iodine; and Y^- is an anion; the ratio of B to A being about 1/1000 to 1/1.

4,420,584

GLASS-FILLED POLYCARBONATE OF IMPROVED IMPACT STRENGTH

Herbert L. Rawlings, New Martinsville, W. Va., and Gerard E. Reinert, McMurray, Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Apr. 29, 1981, Ser. No. 258,817

Int. Cl.³ C08L 69/00

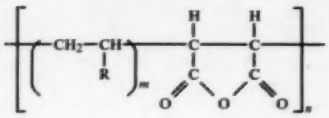
U.S. Cl. 524—502 15 Claims

1. A polycarbonate molding composition comprising

(a) an aromatic polycarbonate resin,

(b) about 5 to 40% by weight, based on the total composition of glass fibers and

(c) about 0.1 to 10% by weight, based on the total composition of a polyanhydride resin characterized by the structural formula:



wherein R is a phenyl or an alkyl substituted phenyl radical or an alkyl radical having from 4 to 16 carbon atoms, n is an integer of from 1 to 200 and m is from 1 to 3.

4,420,585

METHOD OF MIXING ELASTOMERIC POLYMERS FOR IMPROVED PHYSICAL PROPERTIES

Michael C. H. Lee, Sterling Heights, and Darrel S. Nelson, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1982, Ser. No. 412,545
Int. Cl.³ C08K 3/04, 3/36; C08L 7/00, 11/00
U.S. Cl. 524—548 9 Claims

1. A method of improving the physical properties of a crosslinked elastomeric polymer containing a particulate filler comprising the steps of dispersing said filler in the polymer before it is crosslinked; reducing the temperature of the filler and polymer mixture to a temperature between the glass transition temperature and the liquid liquid temperature of the uncrosslinked polymer; working said polymer at said reduced temperature so as to create shear between the polymer and filler to encourage mixing thereof; heating said mixture to a temperature greater than the flow temperature of the uncrosslinked polymer; working said polymer at said elevated temperature such that air bubbles dispersed in the mixture migrate to and are broken at the surface thereof; and repeating said cooling and heating cycles until the particulate filler is uniformly dispersed in the polymer matrix and substantially all the air bubbles are eliminated, said method enhancing the reinforcing effect of the particles in the elastomer after it is crosslinked.

4,420,586

NON-AQUEOUS DISPERSION POLYMERIZATION OF VINYL MONOMERS

Bhupati R. Bhattacharyya, Downers Grove, and Edward G. Ballweber, Glenwood, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 29, 1982, Ser. No. 445,326
Int. Cl.³ L08F 2/14
U.S. Cl. 524—769 13 Claims

1. In a non-aqueous dispersion polymerization process wherein a water-soluble vinyl addition monomer along with a water insoluble vinyl addition monomer is polymerized in the presence of an organic solvent under free radical forming conditions, the improvement comprising using as the organic solvent a material having at least two labile hydrogen atoms, a free hydroxy group and at least one tertiary carbon atom, said solvent further characterized as having from 8–15 carbon atoms.

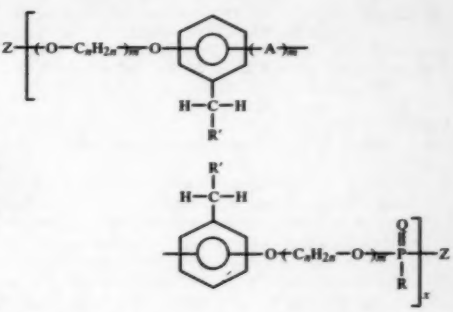
4,420,587

PHOSPHONOPOLYESTER RESIN

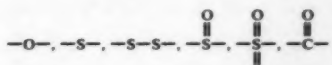
Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 330,106, Dec. 14, 1981. This application Sep. 27, 1982, Ser. No. 423,903
Int. Cl.³ C08G 63/52, 63/54, 63/68
U.S. Cl. 525—39 21 Claims

1. A polyester resin comprising the reaction product of (A) one or more compounds containing at least two hydroxyl groups; and (B) one or more dicarboxylic acids and/or anhydrides thereof wherein at least a portion of component (A) is one or more of an oligomer having recurring units represented by the following general formula



wherein each A is independently



or a divalent hydrocarbon group having from 1 to about 8 carbon atoms; each Q is independently oxygen or sulfur; each R is independently a hydrocarbon group having from about 1 to about 10 carbon atoms; each R′ is independently a —CH=CH$_2$ group or a —CXH—CXH$_2$ group, wherein X is chlorine or bromine; each Z is independently a terminal moiety; each m is independently zero or one; each m′ independently has a value from 1 to about 5; each n independently has a value of 2, 3 or 4; and x has an average value of from 1 to about 10.

4,420,588

WATER-ABSORBING RUBBER COMPOSITION

Yoshihiro Yoshioka, and Hiroshi Harima, both of Ibaraki, Japan, assignors to Kuraray Company Limited, Kurashiki, Japan

Filed Dec. 10, 1981, Ser. No. 329,437
Claims priority, application Japan, Dec. 24, 1980, 55-184418
Int. Cl.³ C08L 9/00
U.S. Cl. 525—93 18 Claims

1. A water-absorbing rubber composition comprising (A) a 1,3-diene rubber with a crystal or glass region content of 5–50% when measured at about 25° C. having molecular weight of 50,000 to 1,000,000 and a melting point of the crystal regions of 20°–90° C., and (B) a highly water-absorbing resin dispersed in said rubber, the ratio of mixing said 1,3-diene rubber to said water-absorbing resin ranging from 10–300 parts by weight of resin per 100 parts by weight of said rubber, said resin being a product of crosslinking of a polymer which contains as a monomer at least 40 mole percent of an α,β-unsaturated compound containing 1 or 2 groups each selected from the class consisting of a carboxyl group and a group

convertible to a carboxyl group with at least one crosslinking agent selected from the group consisting of a polyfunctional epoxy compound containing at least two epoxy groups and a polyamine having a molecular weight or 60–5000 and represented by a general formula $H—(NH—CH_2—CH_2—)_nNH_2$ wherein n is an integer of 1 to 110, said resin being in the form of a powder capable of passing through a 20-mesh Tyler screen and absorbing 20–500 times its own weight of distilled water.

4,420,589

POLYMER COMPOSITION INCLUDING POLYACRYLONITRILE POLYMERS AND PROCESS FOR PREPARING SAME

Vladimir A. Stoy, 281 Jefferson Rd., Princeton, N.J. 08540

Division of Ser. No. 166,032, Jul. 7, 1980, Pat. No. 4,379,874.
This application Sep. 27, 1982, Ser. No. 423,731
Int. Cl.[3] C08L 53/00, 33/20
U.S. Cl. 525—93 14 Claims

1. A process for producing a polymer composition which comprises:

(a) forming a solution of polyacrylonitrile polymer and a block copolymer with acrylonitrile and non-crystalline polymer sequences with an average number of said sequences per multiblock copolymer being equal and at least 2 in a solvent system said acrylonitrile sequence having a mean molecular weight of at least 500, said non-crystalline polymer sequence being comprised of at least about 10 units and constituting one or more highly polar units selected from the group consisting of acrylamide, N-substituted acrylamide, acrylic acid, esters of acrylic acid, salts of acrylic acid, hydrazides of acrylic acid and glutarimide; and

(b) separating said solvent system from said solution to form a polymer composition.

4,420,590

BACTERIOCIDAL RESINS AND DISINFECTION OF WATER THEREWITH

William J. Gartner, Bartlett, Ill., assignor to Halex, Inc., Streamwood, Ill.

Filed Apr. 6, 1981, Ser. No. 251,337
Int. Cl.[3] B01J 41/12; C08F 8/20
U.S. Cl. 525—357 4 Claims

1. A method for the preparation of polyhalide bacteriocidal resins comprising admixing a strong base anion-exchange resin having ion exchange sites with an essentially solid-free aqueous solution of elemental iodine, potassium iodide, and potassium bromide, the elemental iodine being present in proportions, by weight, substantially exceeding that of the potassium iodide, and the potassium iodide being present in proportions, by weight, substantially exceeding that of the potassium bromide, and the elemental iodine being present in proportions exceeding the sum of the amounts of the potassium iodide and the potassium bromide, the materials used in the preparation of said polyhalide bacteriocidal resin being in the ratios represented by the following:

Elemental iodine—200–230 g
KBr—10–30 g
Potassium iodide—90–120 g
H_2O—40–60 g
Starting strong base anion-exchange resin—0.6 L

whereby to produce a resin having attached to a predominant number of such sites a complex of iodine and bromine ions.

4,420,591

METHOD FOR REDUCING WALL FOULING IN VINYL CHLORIDE POLYMERIZATION

Lawrence K. Wempe, Center Valley, and Bernard D. Bauman, Coopersburg, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 5, 1982, Ser. No. 365,117
Int. Cl.[3] C08F 14/06
U.S. Cl. 526—62 4 Claims

1. In a suspension polymerization process wherein a recipe comprising vinyl chloride or a mixture of vinyl chloride and another vinyl monomer, water, a suspension agent, and a monomer soluble polymerization initiator is charged to a stainless steel reactor and subsequently polymerized at an elevated temperature to produce a vinyl chloride containing polymer, the improvement for reducing wall fouling in said stainless steel reactor which comprises:

wetting the internal reactor surface with a solution comprising from about 0.0001–10% by weight of selenous acid and heating the reactor surface to a temperature of from about 40°–100° C. for a period of at least five minutes prior to charging the recipe to the reactor.

4,420,592

PROCESS FOR MULTI-STEP GASEOUS PHASE POLYMERIZATION OF OLEFINS

Akifumi Kato, Ohtake; Junichi Yoshida, Iwakuni, and Ryoichi Yamamoto, Waki, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Oct. 8, 1981, Ser. No. 309,588
Claims priority, application Japan, Oct. 9, 1980, 55-140531
Int. Cl.[3] C08F 2/34
U.S. Cl. 526—65 2 Claims

1. In a process for polymerizing an olefin in the gaseous phase in a multiplicity of steps in at least two independent polymerization zones connected to each other by a transfer passage, which comprises feeding an olefin and a catalyst into a first polymerization zone, polymerizing the olefin in the gaseous phase, intermittently or continuously withdrawing a gaseous stream containing the resulting polymer from the first zone and feeding it into said transfer passage, introducing the withdrawn polymer-containing gaseous stream into a second polymerization zone through the transfer passage, feeding the olefin or an olefin into the second zone with or without feeding an additional supply of the catalyst thereinto, and polymerizing the olefin in the gaseous phase in the second zone; the improvement wherein an inert gas zone is provided in the transfer passage, and at least a part of the gas components of the gaseous stream containing the polymer is replaced by an inert gas selected from the group consisting of saturated hydrocarbons having 1 to 5 carbon atoms and nitrogen.

4,420,593

PROCESS FOR PRODUCING α-OLEFIN POLYMERS

Akihiro Sato, Chibaken; Kazutsune Kikuta, Ichiharashi; Kenji Matsuda, Ichiharashi; Toshihiro Uwai, Ichiharashi, and Tohru Hanari, Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Sep. 28, 1981, Ser. No. 306,228
Claims priority, application Japan, Sep. 29, 1980, 55-134235
The portion of this patent subsequent to Jan. 5, 1999, has been disclaimed.
Int. Cl.[3] C08F 4/66
U.S. Cl. 526—128 33 Claims

1. A process for producing alpha-olefin polymers which comprises

(1) producing a material either:

(a) by reducing $TiCl_4$ with a metal of Group IIa or Group IIIb of the Periodic Table, and subjecting the resulting material to milling or heat treatment to produce a solid product I, or

(b) by reducing $TiCl_4$ with either an organoaluminum

compound or a reaction product of an organoaluminum compound with an electron donor to thereby produce a solid product III, or

(c) by reducing a reaction product of $TiCl_4$ with an electron donor with either an organoaluminum compound or the reaction product of an organoaluminum compound with an electron donor to thereby produce a solid product V,

(2) reacting solid product I or III or V with either

(a) an electron donor (C), or

(b) an electron acceptor (D), or

(c) the reaction product (G) of an electron donor (C) with an electron acceptor (D),

said reaction being carried out by milling reaction or suspension reaction, stepwise one to five times, said reaction resulting in solid product II or IV or VI respectively,

(3) in a preactivating step combining the solid product (a titanium tri-chloride containing composition) resulting from step (2) with an organoaluminum compound (E) and preactivating the resulting combination with an alpha-olefin (F),

(4) before, during, or after the preactivation, reacting the combination in step (3) with a reaction product (H) obtained by reacting one mole of a trialkylaluminum with 0.01 to 5 mols of an electron donor, the reaction of said combination with said reaction product being carried out at a temperature of 0° to 100° C. under a pressure of 0 to 10 kg/cm^2G for a period of one minute to 20 hours and the amount of said reaction product used in this reaction being 0.05 to 10 g based on 1 g of the titanium trichlroide-containing composition contained in said combination; and

(5) polymerizing an alpha-olefin or alpha-olefins in the presence of the preactivated catalyst resulting from step (4).

4,420,594

METHOD FOR POLYMERIZING ETHYLENE

Haruo Ueno, Chiba; Takefumi Yano, Ichihara; Michimasa Shimizu, Ichihara; Masanori Tamura, Ichihara, and Sakae Yuasa, Ichihara, all of Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Feb. 18, 1982, Ser. No. 349,872

Claims priority, application Japan, Feb. 26, 1981, 56-26102

The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.

Int. Cl.³ C08F *4/02, 10/02*

U.S. Cl. 526—128 **32 Claims**

1. A method for polymerizing ethylene which comprises bringing a feed containing ethylene into contact with a catalyst comprising (A) a solid catalytic ingredient which has been prepared in such a manner that (a) a reaction product of an aluminum halide with an organic silicon compound of the formula (I):

$$R^1_nSi(OR^2)_{4-n} \quad (I)$$

wherein R^1 represents a member selected from the group consisting of alkyl radicals having 1 to 8 carbon atoms and a phenyl radical, R^2 represents an alkyl radical having 1 to 8 carbon atoms, and n represents an integer of from 1 to 3, is reacted with a Grignard compound of the formula (II):

$$R^3MgX \quad (II)$$

wherein R^3 represents an alkyl radical having 1 to 8 carbon atoms and X represents a halogen atom and (b) the resultant solid reaction product is brought into contact with a titanium tetrahalide and (B) another catalytic ingredient consisting of at least one trialkyl aluminum of the formula (III):

$$AlR^4_3 \quad (III)$$

wherein R^4 represents an alkyl radical having 2 to 6 carbon atoms.

4,420,595

PROCESS FOR THE PREPARATION OF COPOLYMERS OF ETHYLENE WITH AT LEAST ONE OTHER 1-ALKENE

Georges G. Evens, Maasmechelen, Belgium, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Jul. 10, 1981, Ser. No. 282,012

Claims priority, application Netherlands, Jul. 11, 1980, 8003997; Jun. 5, 1981, 8102723

Int. Cl.³ C08F *4/68, 210/18*

U.S. Cl. 526—141 **9 Claims**

1. A process for copolymerization to form copolymers containing

from 25–85 Wt.% of ethylene units,

from 15–75 Wt.% of units of at least one other 1-alkene,

and up to 20% of units of aliphatic or alicyclic polyunsaturated monomer of from 3 to 20 carbon atoms and having at least two carbon-carbon double bonds

wherein the catalyst system employed contains

(I) a compound of metal from Periodic Table Groups IV-b–VIb,

(II) a compound of metal from Periodic Table Groups I–III in which at least one hydrocarbon group is bound directly to the metal atom through a carbon atom in the presence of a halogen compound of the general formula

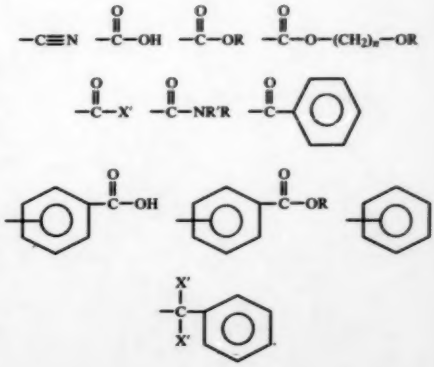
wherein

A is a phenyl or benzoyl group having from one to two substituent nitro groups,

X is a chlorine or bromine atom,

Y is a chlorine, bromine or hydrogen atom, or a hydrocarbon group of from 1 to 8 carbon atoms, and

Z is a hydrogen atom or a group of one of the following formulae, wherein R and R′ represent a hydrocarbon group of 1 to 8 carbon atoms and X′ is a chlorine or bromine atom:



4,420,596

PROCESS FOR POLYMERIZING UNSATURATED ACIDS IN MINERAL SPIRITS

Robert Y. Lochhead, Avon Lake, and John C. Garcia, Lorain, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 27, 1982, Ser. No. 423,913
Int. Cl.³ C08F 2/08
U.S. Cl. 526—212 **10 Claims**

1. A method comprising polymerizing olefinically unsaturated carboxylic acids containing at least one activated carbon to carbon olefinic double bond and at least one carboxyl group in a polymerization media consisting essentially of mineral spirits in the presence of a free radical forming catalyst, (1) sorbitan ester and (2) glycerol or alkylene glycol ester nonionic surface active agents having H.L.B. values of less than 10, and (3) a long chain monohydric aliphatic alcohol containing 8 to 22 carbon atoms.

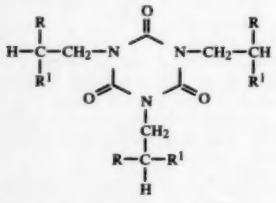
4,420,597

(METH)ACRYLATES OF ISOCYANURIC ACID DERIVATIVES CONTAINING HYDROXYL GROUPS AND THEIR USE AS ADHESIVES

Werner Gruber, Korschenbroich, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Sep. 29, 1981, Ser. No. 306,777
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1980, 3044318
Int. Cl.³ G08F 20/26
U.S. Cl. 526—261 **8 Claims**

1. An anaerobically hardening adhesive and sealing composition comprising one or more compounds of the formula

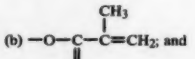


(I)

wherein R is hydrogen, methyl, or ethyl, and each R^1 is a member selected from the group consisting of

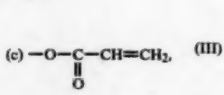
(1) members selected from the group consisting of

(a) —OH;



(II)

(b) —O—C(=O)—C(CH₃)=CH₂; and

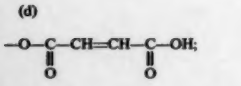


(III)

(c) —O—C(=O)—CH=CH₂,

and

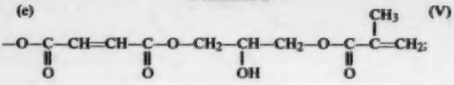
(2) members selected from the group consisting of



(IV)

(d) —O—C(=O)—CH=CH—C(=O)—OH;

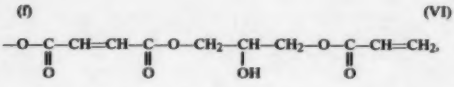
-continued



(V)

(e)

and



(VI)

(f)

with the proviso that only one R^1 can be —OH or a radical of Formula III, IV, or VI,

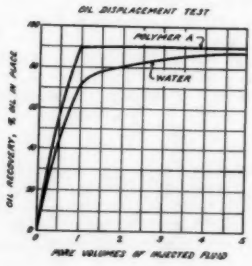
one or more organic peroxides, and one or more customary adjuvant substances.

4,420,598

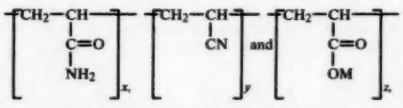
SECONDARY RECOVERY PROCESS USING BRINE SOLUBLE TERPOLYMERS

Abraham Morduchowitz, Monsey, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 158,657, Jun. 11, 1980. This application Aug. 6, 1981, Ser. No. 290,633
Int. Cl.³ C08F 220/26, 220/56, 220/44
U.S. Cl. 526—307.5 **2 Claims**



1. A brine-soluble terpolymer comprising recurring units of:



wherein x, y and z represent the weight percent of the respective units in the terpolymer and x ranges from about 50 to about 60 weight percent, y ranges from about 20 to about 30 weight percent and z ranges from about 10 to about 20 weight percent and wherein M is the radical

$$-(CH_2CH_2O)_nH$$

wherein n is an integer of from 1 to 3 inclusive.

4,420,599

PROCESS OF PRODUCING COPOLYMERS OF AN AROMATIC VINYL MONOMER AND MALEIC ANHYDRIDE

Kenji Seki, and Eiichi Terada, both of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Jul. 21, 1982, Ser. No. 400,471
Claims priority, application Japan, Aug. 5, 1981, 56-121878; Aug. 5, 1981, 56-121879
Int. Cl.³ C08F 222/08, 8/48, 222/16
U.S. Cl. 526—318 17 Claims

1. In a process for producing a copolymer of an aromatic vinyl compound and maleic anhydride, the improvement comprising copolymerizing a monoester maleate and the aromatic vinyl compound, the monoester maleate and the aromatic vinyl compound being present in a ratio of 40–2:60–98% by weight, wherein the monoester maleate is added to the aromatic vinyl compound in at least two steps to thereby obtain a monoester maleate-aromatic vinyl compound copolymer, and wherein no more than 50% of the monoester maleate and the aromatic vinyl compound are converted to the monoester maleate-aromatic vinyl compound in any one of said steps and dealcoholating the monoester maleate portion of the copolymer to obtain the aromatic vinyl compound-maleic anhydride copolymer.

4,420,600

POLYURETHANE ELASTOMERS FROM HINDERED ALIPHATIC DIISOCYANATES

Daniel M. Zavisza, Frederick, Md., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 17, 1982, Ser. No. 450,628
Int. Cl.³ C08G 18/32
U.S. Cl. 528—60 20 Claims

1. A curative composition for curing polyurethane prepolymers prepared from hindered aliphatic diisocyanates, comprising (a) a C_2–C_{10} diol, (b) a C_3–C_{10} aminodiol and (c) a catalytically effective amount of a curing catalyst, and containing 50–99 equivalents of hydroxyl from said diol (a) and 1–50 equivalents of hydroxyl and amino groups from said aminodiol (b) per 100 equivalents of isocyanate groups of the polyurethane prepolymer.

4,420,601

THERMOPLASTIC POLYURETHAN RESIN

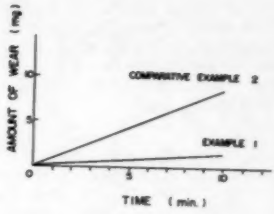
Yoshimi Kuroda, Osaka; Shichinosuke Ito; Akio Midorikawa, both of Izumi, and Kuniomi Terashima, Sakai, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,973
Claims priority, application Japan, Mar. 5, 1981, 56-30445
Int. Cl.³ C08G 18/10, 18/34, 18/52
U.S. Cl. 528—76 17 Claims

1. A thermoplastic polyurethan resin obtained by reacting (1) a polyol component with (2) an organic diisocyanate in a mole ratio, (1)/(2), of 0.8–1.3:0.5–1.2 in the presence, if desired, of a catalyst, said polyol component (1) comprising

(A) a linear polyester polyol and/or polyether polyol having hydroxyl groups at both ends and/or (B) a diol free from a tertiary hydroxyl group, and

(C) a low-molecular-weight polyol having at least one tertiary hydroxyl group (C-1), and/or a polyester polyol and/or polyether polyol having a molecular weight of 500 to 6,000 and containing hydroxyl groups at both ends and at least one tertiary hydroxyl group in the molecular chain (C-2) prepared from said low-molecular-weight polyol (C-1), the proportions of (A), (B) and (C) in said polyol



component (1) being such that the ratio of (C) to the sum of (A), (B) and (C) is from 0.05 to 1.

4,420,602

MELT-POLYMERIZATION PROCESS FOR THE PREPARATION OF THERMOPLASTIC POLYAMIDES AND POLYESTERAMIDES

Henry W. Bonk, Wallingford; Robert G. Nelb, II, North Haven, and Richard W. Oertel, III, Guilford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 27, 1982, Ser. No. 424,418
Int. Cl.³ C08G 18/32
U.S. Cl. 528—80 14 Claims

1. A process for the preparation, in the absence of inert organic solvent, of a thermoplastic polymer which is characterized by a recurring amide linkage which process comprises the steps of:

intimately mixing an organic diisocyanate and a dicarboxylic acid in substantially stoichiometric proportions;

subjecting the reaction mixture to a temperature in the range of about 100° C. to about 230° C. until from about 25 to about 95 percent of the theoretical amount of carbon dioxide necessary to achieve complete reaction has been evolved;

and completing the formation of the thermoplastic polymer by melting the intermediate so formed and homogenizing and degassing the melt at a temperature in the range of above about 230° C. but below that at which degradation of the polymer occurs.

4,420,603
CONTINUOUS, SOLVENT-FREE PROCESS FOR PREPARING THERMOPLASTIC POLYAMIDES AND POLYESTERAMIDES

Robert G. Nelb, II, North Haven, and Richard W. Oertel, III, Guilford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 27, 1982, Ser. No. 424,419
Int. Cl.³ C08G *18/32*
U.S. Cl. 528—80 **12 Claims**

1. A continuous process for the preparation of a thermoplastic polymer characterized by the presence of a recurring amide group which process comprises the steps of:

continuously feeding an organic diisocyanate and a dicarboxylic acid in substantially stoichiometric proportions to the inlet port of a continuous reactor;

continuously conveying said mixture of reactants through said reactor and increasing the temperature of said mixture incrementally from an initial temperature at which evolution of carbon dioxide first commences to a final temperature at which polymer formation is substantially complete, the rate of said incremental increase in temperature being adjusted so that the carbon dioxide which is evolved continuously during the reaction can be vented completely from a plurality of vents provided at intervals throughout the said reactor; and

continuously removing the resulting polymer from said reactor via a shaping zone.

4,420,604
ADMIXTURE OF 2,4,6-TRIS(DIMETHYL AMINOMETHYL)PHENYL AS A CURING AGENT FOR AN EPOXY THREAD LOCKING COMPOSITION

Richard B. Wallace, Bloomfield Hills, Mich., assignor to The Oakland Corporation, Troy, Mich.

Filed Jan. 23, 1981, Ser. No. 227,624
Int. Cl.³ C08G *59/62*
U.S. Cl. 528—93 **12 Claims**

1. A high torque, high temperature resistant thread locking mixture acting between confronting surfaces of a pair of threaded members comprising epoxy resin and a specific phenol curing agent consisting of a mixture of 2, 4, 6 - Tris (dimethylaminomethyl) phenol in approximately equal amounts by volume.

4,420,605
COATING COMPOSITIONS HAVING DUAL CURING MECHANISMS

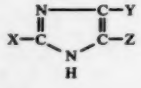
Marvin L. Kaufman, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 221,610, Dec. 31, 1980, abandoned. This application Aug. 26, 1982, Ser. No. 412,043
Int. Cl.³ C08G *59/50, 59/64, 59/68*
U.S. Cl. 528—94 **21 Claims**

1. A coating composition comprising:

(A) at least one 1,2 epoxy resin;

(B) a modified imidazole catalyst comprising an imidazole having the formula:



where

X is methyl, ethyl, or phenyl and Y and Z are hydrogen or methyl; said imidazole being modified by

addition of a C_1–C_{18} alkyl (meth)acrylate, addition of a 1,2-monoepoxide or carbamoylation; followed by neutralization with a lower fatty acid, a lower alkylene dicarboxylic acid, or an aromatic polycarboxylic acid; and

(C) a polyfunctional reactant selected from polyhydric phenols, polycarboxylic acids and dicyandiamide.

4,420,606
ONE COMPONENT WATER REDUCED EPOXY ADHESIVES

Harold G. Waddill, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 15, 1982, Ser. No. 434,683
Int. Cl.³ C08G *59/50*
U.S. Cl. 528—111 **16 Claims**

1. An epoxy resin composition comprising:

(A) a polyepoxide which has been reacted with from 50 wt % to 70 wt % of a polyoxyalkylene monoamine of molecular weight 900 to 2000; and

(B) a curative agent.

4,420,607
POLYESTERS OF TRANS-4,4-STILBENEDICARBOXYLIC ACID, TEREPHTHALIC ACID OR 2,6-NAPHTHALENEDICARBOXYLIC ACID, AND 1,2-PROPANEDIOL

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 15, 1983, Ser. No. 475,567
Int. Cl.³ C08G *63/18, 63/54*
U.S. Cl. 528—298 **5 Claims**

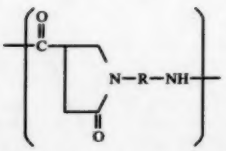
1. A polyester comprising repeating units prepared from 100 to 60 mol % trans-4,4'-stilbenedicarboxylic acid or esters thereof, repeating units prepared from 0 to 40 mol % terephthalic acid or 2,6-naphthalenedicarboxylic acid or esters thereof, and repeating units prepared from 1,2 propanediol, said polyester having an inherent viscosity of about 013 or more determined at 25° C. in 60/40 (wt./wt.) phenol/tetrachloroethane (PTCE) at a concentration of 0.5 g./100 mL and said polyester when injection molded into ⅛ inch flexure bars exhibits a flexural modulus of about 900,000 psi or more.

4,420,608
POLYAMIDES FROM ITACONIC ACID AND DIAMINES

Edwin F. Morello, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 211,587, Dec. 1, 1980. This application Dec. 4, 1981, Ser. No. 327,605
Int. Cl.³ C08G *69/14*
U.S. Cl. 528—324 **12 Claims**

1. A solid copolyamide containing 2–75 percent of the recurring units of the following recurring structure:



the remaining recurring units are based on the copolymerization of at least one dibasic acid or at least one lactam with at least one primary diamine or a mixture of primary diamines and wherein R is a divalent aliphatic or aromatic hydrocarbon radical.

4,420,609

CATALYST DEACTIVATION IN PROPYLENE POLYMERS USING AMMONIUM SALTS

Chi-Hung Lin, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 16, 1981, Ser. No. 311,935
Int. Cl.³ C08F 6/02
U.S. Cl. 528—486 7 Claims

1. A method of deactivating a polyolefin powder containing active catalyst comprising contacting said polymer powder with an inert gas containing about 4 to about 10 wt.% based on the polymer of an ammonium salt selected from the group consisting of ammonium acetate and ammonium bicarbonate in a dry state for about 10 to about 90 minutes in a fluidized bed.

4,420,610

SOLVENT EXCHANGE PROCESS FOR CARBOXYL CONTAINING POLYMER SLURRIES

Eugene J. Sehm, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 19, 1983, Ser. No. 459,065
Int. Cl.³ C08K 5/01
U.S. Cl. 528—501 16 Claims

1. A process for exchanging the solvent, having a boiling point of less than about 125° C., used as the polymerization media in the polymerization of unsaturated carboxylic acid monomers to form a slurry of the carboxylic acid polymer in the polymerization media, with a petroleum based, substantially aliphatic, hydrocarbon liquid having a boiling range of about 140° C. to about 350° C., comprising heating the slurry to distill off the polymerization media in the presence of the petroleum base liquid that is present in the slurry being heated at least before about 50 volume percent of the polymerization media has been removed by distillation, and continuing the distillation until substantially all of the polymerization media has been distilled off and replaced during the distillation with the petroleum base liquid in amounts equal to at least about one-half the volume of the polymerization media originally present in the slurry, the total amount of polymerization media and/or petroleum base liquid present in the slurry during the distillation being sufficient to maintain the polymer slurry during the exchange of the polymerization media and the petroleum base liquid, whereby a slurry of the carboxylic acid polymer in the petroleum base liquid is obtained.

4,420,611

STABILIZATION OF IRRADIATED CARBOXYMETHYL CELLULOSE

Bernard J. Scheve, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 18, 1982, Ser. No. 359,553
Int. Cl.³ C08B 11/20
U.S. Cl. 536—88 10 Claims

1. A process for the treatment of irradiated carboxymethyl cellulose which consisting essentially of heat treating irradiated carboxymethyl cellulose at a temperaure from about 50° C. to about 150° C. for a time sufficient to effect stabilization.

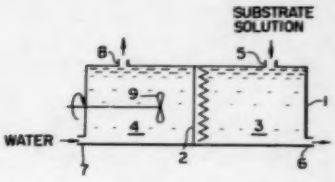
4,420,612

CATALYST MEMBRANE

Seiichi Aiba; Kazuhisa Hiratani, both of Yatabe, and Tsutomu Nakagawa, Musashino, all of Japan, assignors to Director Genereal of Agency of Industrial Science & Technology, Tokyo, Japan

Division of Ser. No. 339,741, Jan. 15, 1982, abandoned. This application Feb. 28, 1983, Ser. No. 470,640
Claims priority, application Japan, Jan. 19, 1981, 56-6072
Int. Cl.³ C08B 31/00
U.S. Cl. 536—102 7 Claims

1. A method of hydrolyzing an acid-catalyzable, water soluble organic substance, comprising contacting a solution containing said substance with a catalyst membrane which comprises a porous polytetrafluoroethylene membrane having grafted thereon polystyrenesulfonic acid, wherein said porous



polytetrafluoroethylene membrane has a thickness of 30 to 200 u and an average pore size diameter of 0.1 to 1.2 u.

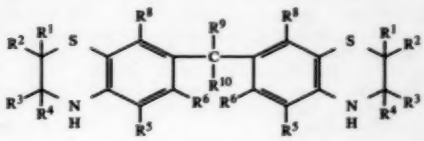
4,420,613

DIHYDROBENZOTHIAZINE COMPOUNDS AND THE PREPARATION THEREOF

Paul Uhrhan, Odenthal; Edmund Krauthausen, Cologne; Kurt-Rainer Stahlke, Kuerten; Gerwolf Quaas, Cologne, and Lothar Ruetz, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 17, 1982, Ser. No. 358,891
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111513
Int. Cl.³ C07D 279/16, 417/06, 417/14
U.S. Cl. 544—51 7 Claims

1. A compound of the formula

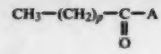


wherein

R^1 and R^2, which may be the same or different, each represents hydrogen, lower alkyl containing from 1 to 4 carbon atoms, cycloalkyl containing from 5 to 8 carbon atoms, aralkyl containing from 7 to 11 carbon atoms or carbocyclic aryl having 6 carbon atoms or together represent a radical $-(CH_2)_m-$ wherein m represents an integer of from 4 to 7;

R^3 and R^4 which may be the same or different, each represents lower alkyl containing from 1 to 4 carbon atoms, cyclohexyl, aralkyl containing from 7 to 11 carbon atoms or carbocyclic aryl having 6 carbon atoms or together represent a radical $-(CH_2)_n-$ wherein n represents an integer of from 4 to 7, or one of the radicals R^3 or R^4 together with R^1 or R^2 represents an alkylene radical containing from 3 to 6 carbon atoms;

R^6 and R^8, which may be the same or different, each represents hydrogen, halogen, nitro, linear or branched alkyl containing from 1 to 12 carbon atoms, linear or branched alkenyl containing from 2 to 12 carbon atoms, aralkyl containing from 7 to 11 carbon atoms, cycloalkyl containing from 5 to 8 carbon atoms, and the radicals R^5 are the same or different and represent hydrogen, halogen, nitro, linear or branched alkyl containing from 1 to 12 carbon atoms, linear or branched alkenyl containing from 2 to 12 carbon atoms, cycloalkyl containing from 5 to 8 carbon atoms, aralkyl containing from 7 to 11 carbon atoms, alkoxy, the radical

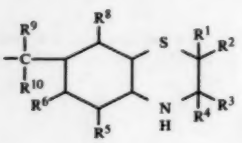


wherein

p represents an integer of from 0 to 20, preferably from 8 to 16, and

A represents $-(CH_2)_q-$, $-O-(CH_2)_q-$, $-NH-(CH_2)_q-$ or $-S-(CH_2)_q$

q=0 to 4, preferably 0 or 1, or the radical



wherein

R^1 to R^6 and R^8 are as defined above, while R^9 and R^{10} represent the radicals defined below, and R^9 and R^{10} independently represent hydrogen, carbocyclic aryl having 6 carbon atoms, linear or branched alkyl containing from 1 to 12 carbon atoms, cycloalkyl or cycloalkenyl containing from 5 to 8 carbon atoms or R^9 and R^{10} together with the carbon atoms to which they are attached complete a cycloalkyl radical containing from 5 to 7 carbon atoms.

4,420,614

CYANOPHENOXYBENZYL AMINES

Colin Wilshire, Doncaster East, and Rene Jongen, Parkville, both of Australia, assignors to ICI Australia Limited, Victoria, Australia

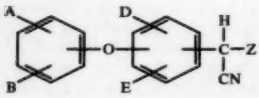
Filed Sep. 8, 1981, Ser. No. 300,191

Claims priority, application Australia, Oct. 3, 1980, PE5871

Int. Cl.[3] **C07D** *295/14, 207/16;* **C07C** *121/78*

U.S. Cl. 544—163 **6 Claims**

1. A compound of formula I



I

wherein:

A, B, D and E are independently chosen from the group consisting of hydrogen, halogen, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl and C_1 to C_6 alkoxy; and Z is chosen from NR^1R^2 and $N^{\oplus}R^1R^2R^3X^{\ominus}$ wherein:

R^1 and R^2 are idependently chosen from the group consisting of C_1 to C_6 alkyl, phenyl, benzyl, and the groups phenyl and benzyl wherein in each group the phenyl ring is substituted with from one to three substituents chosen from the group consisting of halogen, nitro, cyano, hydroxy, C_1 to C_6 alkyl, C_1 to C_6 alkoxy and C_1 to C_6 haloalkyl, or R^1 and R^2 are linked to form a heterocyclic ring chosen from the group consisting of 1-pyrrolyl, 1-imidazolyl, 1-pyrrolidinyl, 1-pyrrolinyl, 1-imidazolinyl, piperidino, 1-piperazinyl and morpholino;

R^3 is chosen from the group consisting of C_1 to C_6 alkyl, phenyl, benzyl, and the groups phenyl and benzyl wherein in each group the phenyl ring is substituted with from one to three substituents chosen from the group consisting of halogen, nitro, cyano, hydroxy, C_1 to C_6 alkyl, C_1 to C_6 alkoxy and C_1 to C_6 haloalkyl, or $N^{\oplus}R^1R^2R^3$ is a pyridinium, pyrazinium, pyrimidinium or pyridazinium ring; and

$X^{\ominus}$ is the anion of an organic or an inorganic acid.

4,420,615

SUBSTITUTED PYRIDOPYRIMIDINES AS GASTRIC SECRETION INHIBITORS

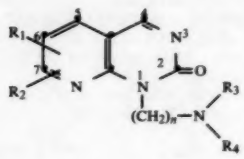
William A. Bolhofer, Frederick; Edward J. Cragoe, Lansdale, and Jacob M. Hoffman, Jr, North Wales, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 24, 1981, Ser. No. 295,930

Int. Cl.[3] **C07D** *471/14;* **A61K** *31/495*

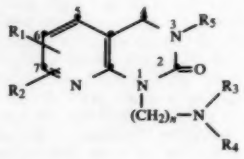
U.S. Cl. 544—279 **8 Claims**

1. Compounds having the formulae:



(I)

and



(II)

wherein:

R_1 and R_2 are independently hydrogen, halololoweralkyl, loweralkyl, loweralkoxy;

R_3 and R_4 are independently hydrogen, loweralkyl, cycloloweralkyl, or R_3 and R_4 may be joined, together with the nitrogen to which they are attached to form a piperazine ring or an N-loweralkyl piperazine ring;

R_5 is hydrogen or lower alkyl;

n is 2–5; and,

the physiologically acceptable salts thereof.

4,420,616

OXIDATIVE PROCESS FOR THE PREPARATION OF COPPER QUINOLINATE

Seishi Ikegami, Yao, and Yoshihiro Hatano, Osaka, both of Japan, assignors to Yamamoto Kagaku Gosei Co., Ltd., Osaka, Japan

Filed Feb. 20, 1981, Ser. No. 236,945

Claims priority, application Japan, Feb. 25, 1980, 55-21623

Int. Cl.[3] **C07D** *213/87*

U.S. Cl. 546—5 **3 Claims**

1. A process for the preparation of copper quinolinate by oxidizing quinoline with hydrogen peroxide in a mixture of water and sulfuric acid in the presence of copper sulfate at a temperature of 55°–75° C. and isolating copper quinolinate from the reaction media, wherein the molar ratio of sulfuric acid to quinoline is greater than 1 to 1, the molar ratio of hydrogen peroxide to quinoline is 10.8 to 1 or greater, the concentration of sulfuric acid is from about 10 to about 30% in said mixture, the oxidation reaction is carried out under a pressure of less than 400 mm Hg and said process is performed by adding copper oxide, quinoline and hydrogen peroxide to the reaction media left after isolation of copper quinolinate prepared according to a previous run of the process.

4,420,617

5(PYRIDINYL)PYRIDIN-2-AMINES

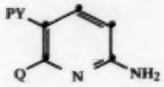
George Y. Lesher; Chester J. Opalka, Jr., both of Schodack, and Donald F. Page, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 307,778, Oct. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 135,100, Mar. 28, 1980, Pat. No. 4,297,360. This application Jul. 6, 1982, Ser. No. 395,737

Int. Cl.³ C07D *401/04*

U.S. Cl. 546—257 5 Claims

1. A 5-PY-6-Q-pyridin-2-amine having the formula



or pharmaceutically acceptable acid-addition salt thereof, where Q is hydrogen or lower-alkyl, and PY is 4-pyridinyl or 4-pyridinyl having one or two lower-alkyl substituents.

4,420,618

PROCESS FOR PRODUCING 5-CHLORO-β-TRIFLUOROMETHYLPYRIDINES

Isso Yokomichi, Moriyama; Takahiro Haga, Kusatsu; Rikuo Nasu, Kyoto; Kuniaki Nagatani, and Toshio Nakajima, both of Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Continuation of Ser. No. 237,481, Feb. 23, 1981, abandoned. This application Jul. 26, 1982, Ser. No. 401,744

Claims priority, application Japan, Mar. 7, 1980, 55-28826

Int. Cl.³ C07D *213/26, 213/61*

U.S. Cl. 546—345 9 Claims

1. A process for producing 5,6-dichloro-β-trifluoromethylpyridine or 2,5,6-trichloro-β-trifluoromethylpyridine which comprises reacting 6-chloro-β-trifluoromethylpyridine or 2,6-dichloro-β-trifluoromethylpyridine with chlorine gas to chlorinate the 5-position of the pyridine nucleus thereof:

(1) at a temperature of 100° C. to 250° C. and at least sufficient amount of chlorine for the reaction;

(2) in the presence of a catalyst of amount of at least 40% by weight (based on the 6-chloro or/and 2,6-dichloro-β-trifluoromethylpyridine), the catalyst being chlorides of a metallic element selected from the group consisting of iron, tungsten, molybdenum, titanium, and antimony.

4,420,619

IMIDAZOLE UREA AND AMIDO COMPOUNDS

Adrian Marxer, Muttenz, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

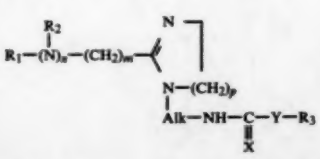
Division of Ser. No. 14,661, Feb. 23, 1979, Pat. No. 4,292,429. This application Mar. 25, 1981, Ser. No. 247,427

Claims priority, application Switzerland, Mar. 8, 1978, 2519/78

Int. Cl.³ A61K *31/415;* C07D *233/20, 233/50, 233/06*

U.S. Cl. 548—352 5 Claims

1. An urea or amido compound of formula



(I)

in which R_1 is phenyl or phenyl substituted by a group selected from halogen, lower alkyl, lower alkoxy and R_3 is phenyl or phenyl substituted by a group selected from halogen, lower alkyl, lower alkoxy, lower alkoxycarbonyl, carboxyl or trifluoromethyl, R_2 is hydrogen or lower alkyl, n is 0 to 1, m is 0 or 1, p is 1, Alk is a lower alkylene radical with 2–3 carbon atoms in the linear chain X is oxygen or sulphur, and Y the imino group or a direct bond, or therapeutically acceptable salts thereof.

4,420,620

PREPARATION OF 2-PYRROLIDONES

Jawad H. Murib, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 27, 1981, Ser. No. 325,449

Int. Cl.³ C07D *201/08*

U.S. Cl. 548—554 7 Claims

1. A process for preparing an unsubstituted or N-substituted pyrrolidone having the structure:

wherein R is H, a lower alkyl, or a lower hydroxyalkyl which comprises the step of reacting methyl 4-oxobutyrate with a compound having the formula

H_2NR

wherein R is as previously defined, and hydrogen in the presence of a catalytically effective amount of a hydrogenation catalyst selected from the group consisting of palladium, platinum, nickel and ruthenium and alloys and compounds of the foregoing at a temperature of from 80° to 200° C. and a partial pressure of hydrogen of from 250 to 2,000 psig for from about 15 minutes to about 24 hours thus forming said unsubstituted or N-substituted pyrrolidone and methanol by-product.

4,420,621

PREPARATION OF POLYCARBOXYLIC COMPOUNDS

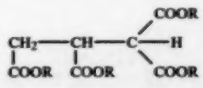
Eddie N. Gutierrez, Fort Lee, and Vincent Lamberti, Upper Saddle River, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 47,859, Jun. 12, 1979, abandoned, which is a continuation of Ser. No. 905,308, May 12, 1978, abandoned, which is a division of Ser. No. 642,804, Dec. 22, 1975, Pat. No. 4,123,459. This application Dec. 17, 1980, Ser. No. 217,347

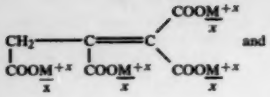
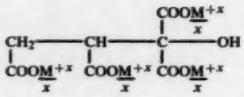
Int. Cl.³ C07D *307/32;* C07C *51/38*

U.S. Cl. 549—322 5 Claims

1. A process for preparing a mixture of aconitic acid and lactones of isocitric acid and alloisocitric acid comprising chlorinating a compound of the formula



wherein R independently represents a lower primary alkyl group of 1 to 4 carbon atoms in an aqueous medium with hypochlorous acid to form a chlorinated tetraester; dehydrohalogenating and saponifying said chlorinated tetraester in an aqueous medum with $M/x^{+x}OH$, wherein M represents a lithium, sodium, potassium calcium, strontium or barium cation and x represents 1 or 2 and is equivalent to the valency of M, to form an aqueous mixture of propene and hydroxy propane compounds of the formulas


and


acidifying said aqueous mixture with a mineral acid to a pH of less than 2 to form said aconitic acid and said lactones.

4,420,622

PROCESS FOR THE PREPARATION OF A 5-ALKYL-BUTYROLACTONE

Cornelis G. M. van de Moesdijk, Elsloo, and Petrus H. J. Janssen, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

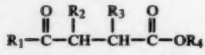
Filed May 21, 1982, Ser. No. 380,757

Claims priority, application Netherlands, Jul. 2, 1981, 8103173

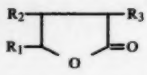
Int. Cl.³ C07D *307/32*

U.S. Cl. 549—326 **5 Claims**

1. A process for the preparation of a 5-alkyl-butyrolactone compound comprising reacting a keto-ester of the formula



wherein R_1 represents an alkyl group of 1–4 carbon atoms, R_2 and R_3 each independently represent hydrogen or an alkyl group of 1–4 carbon atoms and R_4 represents a hydrogen group having at most 8 carbon atoms,
with hydrogen at a temperature of 150°–325° C., in the gas phase and in the presence of a solid particulate hydrogenation catalyst, containing a metal or a compound of a metal from Group VIII or Group Ib of the Periodic Table, and recovering from the reaction mixture obtained a 5-alkyl-butyrolactone which has the general formula



where R_1, R_2 and R_3 have the meaning indicated above.

4,420,623

PROCESS AND INTERMEDIATES FOR PREPARING 6'-METHYLSPECTINOMYCIN AND ANALOGS THEREOF

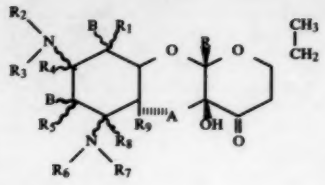
David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 285,165, Jul. 20, 1981, Pat. No. 4,380,652. This application Mar. 17, 1982, Ser. No. 358,957

Int. Cl.³ C07D *319/20, 327/06*

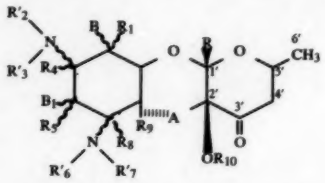
U.S. Cl. 549—361 **3 Claims**

1. A process for preparing a compound having the formula

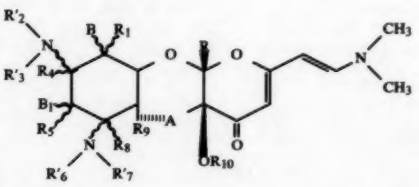

I

which comprises

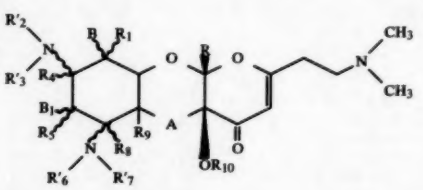
(a) reacting a compound having the formula


VI

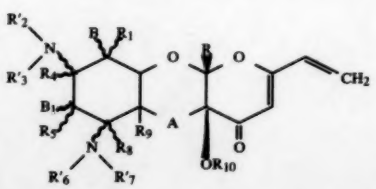
with dimethylformamide dimethylacetal to obtain a compound having the formula


V

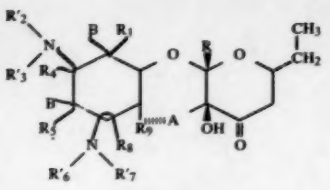
(b) reacting the compound of formula V with sodium cyanoborohydride to obtain a compound having the formula


IV

(c) reacting the compound of formula IV with methyliodide to obtain a compound having the formula


III

(d) reducing the compound of formula III with hydrogen in the presence of a platinum catalyst to obtain a compound having the formula



II

and

(e) deprotecting the compound of formula II to obtain I, wherein R is hydrogen or alkyl and R_1 through R_9 are selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and lower alkynyl with the proviso that one of R_2 and R_3 is always hydrogen and one of R_6 and R_7 is always hydrogen, and B and B_1 are the same or different and are selected from the group consisting of hydrogen, hydroxy, alkoxy, o-lower alkenyl, thio, thio lower alkyl and thio-lower alkenyl; and A is selected from the group consisting of oxygen and sulfur; R'_2, R'_3, R'_6 and R'_7 are selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, and a blocking group selected from the group consisting of aralkoxycarbonyl, halogenated-alkoxycarbonyl and alkoxycarbonyl; with the proviso that that one of R'_2 and R'_3 is always a blocking group and one of R'_6 and R'_7 is always a blocking group; and R_{10} is acyl.

4,420,624

PROCESS FOR PREPARING SPECTINOMYCIN ANALOGS

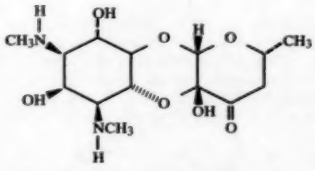
David R. White, and Richard C. Thomas, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 150,530, May 16, 1980, Pat. No. 4,351,771. This application Mar. 17, 1982, Ser. No. 359,006

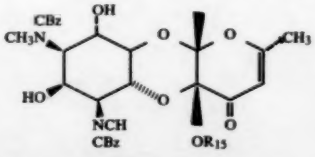
Int. Cl.³ C07D *327/06, 327/08, 323/04, 319/20*

U.S. Cl. 549—361 **4 Claims**

1. A process for preparing a compound having the formula



which comprises reacting a compound having the formula



with hydrogen in the presence of a base wherein R_{15} is acyl or hydrogen and CBz is carbobenzyloxy.

4,420,625

ALKYLENE OXIDES PRODUCED BY DIRECT OXIDATION OF OLEFINS OVER TRANSITION METAL BORATES IN THE PRESENCE OF A NON-POLAR, AROMATIC ORGANIC SOLVENT

John R. Sanderson; Walter H. Brader, Jr., and Lewis W. Watts, Jr., all of Austin, Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Sep. 23, 1982, Ser. No. 421,925

Int. Cl.³ C07D *301/06*

U.S. Cl. 549—533 **16 Claims**

1. A process for the production of alkylene oxides comprising reacting an olefin or a mixture of olefins with oxygen in the presence of a transition metal borate catalyst and a non-polar, aromatic organic solvent.

4,420,626

DIOXATRICYCLIC PROSTACYCLIN ANALOGS

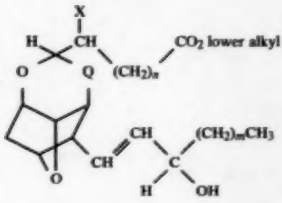
Martin F. Haslanger, Lambertville, and Peter W. Sprague, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 305,663, Sep. 25, 1981, Pat. No. 4,360,685. This application Jun. 28, 1982, Ser. No. 393,207

Int. Cl.³ C07D *311/78, 307/93*

U.S. Cl. 549—386 **7 Claims**

1. A prostacyclin analog intermediate having the structure



including all stereoisomers thereof; wherein Q is a single bond or $—CH_2—$, X is Br or I, m is 1 to 9, and n is 3 or 4.

4,420,627

HYDRAZINE DYES

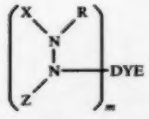
Gary N. Widiger, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 18, 1981, Ser. No. 332,020

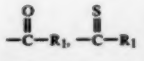
Int. Cl.³ G03C *1/40*

U.S. Cl. 549—394 **2 Claims**

1. A compound represented by the formula



wherein X is



or $—SO_2R_1$; Z is H, alkyl or aryl; R is H, alkyl or aryl provided that Z and R are not both H; DYE is a xanthene dye moiety; R_1 is H, alkyl, aryl, $—NH_2$, NHR_2,

or OR_2; R_2 is H, alkyl or aryl; and m is 1 or 2.

4,420,628

PROCESS FOR PREPARING THREO-2-HYDROXY-3-(4-METHOXYPHENYL)-3-(2-NITROPHENYLTHIO)-PROPIONIC ESTER

Hirozumi Inoue, Oizumi-Gakuen, and Tomiki Hashiyama, Ageo, both of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

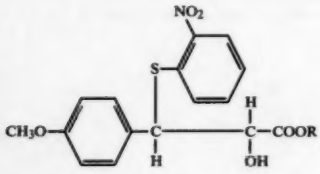
Filed Feb. 8, 1982, Ser. No. 346,922

Claims priority, application Japan, Feb. 27, 1981, 56-28779; May 22, 1981, 56-78317

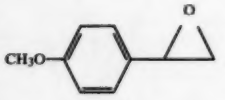
Int. Cl.³ C07C *149/40*

U.S. Cl. 560—17 **6 Claims**

1. A method for preparing a threo-2-hydroxy-3-(4-methoxyphenyl)-3-(2-nitrophenylthio)propionic ester of the formula:



wherein R is an ester residue, which comprises condensing a trans-3-(4-methoxyphenyl)glycidic ester of the formula:



wherein R is the same as defined above, with 2-nitrothiophenol in the presence of a Lewis acid selected from the group consisting of boron trifluoride, stannous halide, stannic halide, zinc halide, ferrous halide, ferric halide, cuprous halide, cupric halide, antimony trihalide, antimony pentahalide, cadmium halide, nickel halide, stannous alkanoate, stannic alkanoate, zinc alkanoate, zinc salicylate, zinc oxalate, sulfuric acid, perhalogenic acid, alkanoic acid, aromatic carboxylic acid, sulfonic acid, phosphoric acid and polyphosphoric acid.

4,420,629

METHOD OF PREPARING 3-ALKYL-6-METHYL-β-RESORCYLIC ACID ESTERS

Hans-Georg Schmidt, Niederkassel-Ranzel, Fed. Rep. of Germany, assignor to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

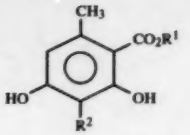
Filed Sep. 10, 1982, Ser. No. 416,733

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136720

Int. Cl.³ C07C *69/88*

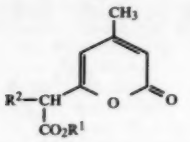
U.S. Cl. 560—70 **7 Claims**

1. Process of preparing 3-alkyl-6-methyl-β-resorcylic acid esters of the formula



I

wherein R^1 and R^2 are individually select from alkyl groups from 1 to 10 carbon atoms which process comprises reacting an alpha-pyrone of the formula



II

wherein R^1 and R^2 are identified as above with a base, to result in the desired ester compound.

4,420,630

POLYMERIZABLE VINYL BENZOATES

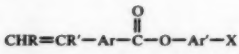
Paul D. Yacobucci, and John C. Wilson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 10, 1981, Ser. No. 329,548

Int. Cl.³ C07C *69/76*

U.S. Cl. 560—104 **2 Claims**

1. A compound having the formula:



wherein:

R and R′ are independently selected from the group consisting of H, halide and alkyl;

Ar and Ar′ are independently arylene;

X is selected from the group consisting of $NHSO_2R^2$, $CH_2NHSO_2R^2$ and SO_2NHR^2; and

R^2 is selected from the group consisting of alkyl, aryl and aralkyl.

4,420,631

ESTERS OF THE CARBOXYLIC ACID

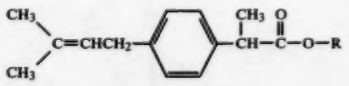
Takehiro Amano, Urawa; Toshihisa Ogawa, Ageo; Kensei Yoshikawa, Kitamoto; Yoshinori Shiobara, Ohmiya; Tatsuhiko Sano, Ohmiya; Yutaka Ohuchi, Ohmiya; Tohru Tanami, Tokyo; Shoichi Ito, Tokyo, and Jiro Sawada, Tokyo, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

Filed May 19, 1982, Ser. No. 379,632

Int. Cl.³ C07L *69/76*

U.S. Cl. 560—104 **5 Claims**

1. A carboxylic acid ester having the following general formula



wherein R is alkoxyalkyl having 2 to 6 carbon atoms, cycloalkyl having 5 or 6 carbon atoms, tetrahydrofurfuryl, alkyl having 1 to 6 carbon atoms or said alkyl substituted with 1 or 2 hydroxy groups.

4,420,632

COMPOSITION AND PROCESS

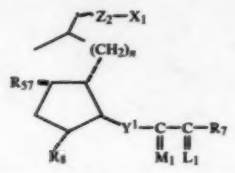
Paul A. Aristoff, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 140,547, Apr. 15, 1980, abandoned. This application Dec. 22, 1980, Ser. No. 219,175

Int. Cl.³ C07C 177/00, 57/26

U.S. Cl. 560—119 6 Claims

1. A carbacyclin analog of formula X:



X

wherein n is one or 2;

wherein L_1 is α-R_3:β-R_4, α-R_4:β-R_3, or a mixture of α-R_3:β-R_4 and α-R_4:β-R_3, wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein M_1 is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;

wherein R_7 is

(1) $—C_mH_{2m}—CH_3$, wherein m is an integer from one to 5, inclusive,

(2) phenoxy optionally substituted by one, two or three chloro, fluoro, trifluoromethyl, (C_1-C_3)alkyl, or (C_1-C_3)alkoxy, with the proviso that not more than two substituents are other than alkyl, with the proviso that R_7 is phenoxy or substituted phenoxy, only when R_3 and R_4 are hydrogen or methyl, being the same or different,

(3) phenyl, benzyl, phenylethyl, or phenylpropyl optionally substituted on the aromatic ring by one, two or three chloro, fluoro, trifluoromethyl, (C_1-C_3)alkyl, or (C_1-C_3)alkoxy, with the prosivo that not more than two substituents are other than alkyl,

(4) cis—CH=CH—CH_2—CH_3,

(5) $—(CH_2)_2—CH(OH)—CH_3$, or

(6) $—(CH_2)_3—CH=C(CH_3)_2$;

wherein —C(L_1)—R_7 taken together is

(1) (C_4-C_7)cycloalkyl optionally substituted by one to 3 (C_1-C_5)alkyl;

(2) 2-(2-furyl)ethyl,

(3) 2-(3-thienyl)ethoxy, or

(4) 3-thienyloxymethyl;

wherein R_8 is hydroxy, hydroxymethyl, or hydrogen;

wherein R_{57} is (C_1-C_4)alkyl;

wherein X_1 is

(1) $—COOR_1$, wherein R_1 is

(a) hydrogen,

(b) (C_1-C_{12})alkyl,

(c) (C_3-C_{10})cycloalkyl,

(d) (C_7-C_{12})aralkyl,

(e) phenyl, optionally substituted with one, 2 or 3 chloro or (C_1-C_3)alkyl,

(f) phenyl substituted in the para position by

(i) —NH—CO—R_{25},

(ii) —CO—R_{26},

(iii) —O—CO—R_{54}, or

(iv) —CH=N—NH—CO—NH_2 wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —N_2; R_{26} is methyl, phenyl, —NH_2, or methoxy; and R_{54} is phenyl or acetamidophenyl; inclusive, or

(g) a pharmacologically acceptable cation;

(2) $—CH_2OH$,

(3) —COL_4, wherein L_4 is

(a) amino of the formula $—NR_{51}R_{52}$, wherein R_{51} and R_{52} are

(i) hydrogen,

(ii) (C_1-C_{12})alkyl,

(iii) (C_3-C_{10})cycloalkyl,

(iv) (C_7-C_{12})aralkyl,

(v) phenyl, optionally substituted with one, 2 or 3 chloro, (C_1-C_3)alkyl, hydroxy, carboxy, (C_2-C_5)alkoxycarbonyl, or nitro,

(vi) (C_2-C_5)carboxyalkyl,

(vii) (C_2-C_5)carbamoylalkyl,

(viii) (C_2-C_5)cyanoalkyl,

(ix) (C_3-C_6)acetylalkyl,

(x) (C_7-C_{11})benzoalkyl, optionally substituted by one, 2 or 3 chloro, (C_1-C_3)alkyl, hydroxy, (C_1-C_3)alkoxy, carboxy, (C_2-C_5)alkoxycarbonyl, or nitro,

(xi) pyridyl, optionally substituted by one, 2 or 3 chloro, (C_1-C_3)alkyl, or (C_1-C_3)alkoxy,

(xii) (C_6-C_9-pyridylalkyl optionally substituted by one, 2 or 3 chloro, (C_1-C_3)alkyl, hydroxy, or (C_1-C_3)alkyl,

(xiii) (C_1-C_4)hydroxyalkyl,

(xiv) (C_1-C_4)dihydroxyalkyl,

(xv) (C_1-C_4)trihydroxyalkyl,

with the further proviso that not more than one of R_{51} and R_{52} is other than hydrogen or alkyl,

(b) cycloamino selected from the group consisting of pyrolidino, piperidino, morpholino, piperazino, hexamethyleneimino, pyrrolino, or 3,4-didehydropiperidinyl optionally substituted by one or 2 (C_1-C_{12})alkyl of one to 12 carbon atoms, inclusive,

(c) carbonylamino of the formula $—NR_{53}COR_{51}$, wherein R_{53} is hydrogen or (C_1-C_4)alkyl and R_{51} is other than hydrogen, but otherwise as defined above,

(d) sulfonylamino of the formula $—NR_{53}SO_2R_{51}$, wherein R_{51} and R_{53} are as defined in (c),

(4) $—CH_2NL_2L_3$, wherein L_2 and L_3 are hydrogen or (C_1-C_4)-alkyl, being the same or different, or the pharmacologically acceptable acid addition salts thereof when X_1 is $—CH_2NL_2L_3$,

wherein Y_1 is trans—CH=CH—, cis—CH=CH—, —CH_2C-H_2—, or —C≡C—; and

wherein Z_2 is

(1) $—CH_2—(CH_2)_f—C(R_2)_2$, wherein R_2 is hydrogen or fluoro and f is zero, one, 2, or 3, or

(2) trans—CH_2—CH=CH—.

4,420,633

PROCESS FOR THE PREPARATION OF AN ESTER OF FORMIC ACID

Shinichi Furusaki; Noriaki Manada; Hisao Yamashina, and Masaoki Matsuda, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Dec. 17, 1981, Ser. No. 331,614

Claims priority, application Japan, Jan. 8, 1981, 56-707

Int. Cl.³ C07C 67/36, 69/06

U.S. Cl. 560—232 20 Claims

1. A process for the preparation of an ester of formic acid which comprises reacting hydrogen, carbon monoxide and an ester of nitrous acid in a catalytic vapor phase reaction in the presence of a platinum group metal or a salt thereof and at a temperature of not less than 40° C. under a pressure of 0.1 to 100 atmospheres.

4,420,634

PROCESS FOR THE OXIDATION OF UNSATURATED ALIPHATIC HYDROCARBONS

Franco Codignola, Largo Corsia dei Servi 3; Paolo Gronchi, Via Servio Tullio 4; Renato del Rosso, Via Palmanova 67, and Paolo Centola, Via Paisiello 28, all of Milan, Italy

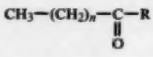
Filed Dec. 8, 1980, Ser. No. 214,032

Claims priority, application Italy, Jun. 10, 1980, 22676 A/80

Int. Cl.³ C07C *51/25, 51/09, 27/12, 45/32, 45/34, 45/35, 45/37*

U.S. Cl. 562—512.2 8 Claims

1. A process for the selective oxidation in liquid phase of mono-unsaturated aliphatic hydrocarbons to obtain compounds having the formula:



wherein: R=H, OH or C_1–C_2 alkyl and n=O or 1,

wherein the oxidation is conducted in the presence of oxygen or air, in an organic solvent, at a temperature of 70° to 150° C. and at a pressure of 5 to 50 atmospheres, in the presence of a catalyst consisting of a trivalent cobalt complex formed by a cobalt salt of an organic acid containing at least two carbon atoms with a carbonyl compound of the aldehyde or ketone type.

4,420,635

AMMONIUM CARBAMATE PRODUCTION

James M. Washington, Richmond; Dale R. Fillenwarth, Ashland, and Francis V. Utsch, Midlothian, all of Va., assignors to Philip Morris Inc., New York, N.Y.

Filed Aug. 11, 1980, Ser. No. 177,291

Int. Cl.³ C07C *125/02*

U.S. Cl. 562—555 3 Claims

1. A process adapted for producing free-flowing ammonium carbamate having an average particle size between about 2–10 microns, and having a purity of substantially 100 percent, which process comprises (1) injecting a pressurized stream of anhydrous liquid carbon dioxide into a moisture-free environment, wherein adiabatic expansion decreases the temperature of the carbon dioxide into the range between about 10° F. and −110° F.; and (2) contacting the adiabatically expanding carbon dioxide with a stream of anhydrous liquid ammonia to form particualate ammonium carbamate, wherein the molar ratio of carbon dioxide to ammonia in the contacting zone is between about 1.5–5:1, and the temperature in the contacting zone is maintained in the range between about 70° F. and 120° F., and wherein said liquid ammonia is injected into the approximate center of said stream of carbon dioxide in order to increase mixing.

4,420,636

CALCIUM AMMONIUM LACTATE

Fred W. Juengst, Jr., Green Bay, and John A. Dika, Kewaunee, both of Wis., assignors to Calor Agriculture Research, Inc., Okemos, Mich.

Division of Ser. No. 109,480, Jan, 4, 1980, Pat. No. 4,333,956, which is a continuation-in-part of Ser. No. 93,162, Nov. 13, 1979, abandoned. This application Oct. 27, 1981, Ser. No. 315,462

Int. Cl.³ C07C *59/08*

U.S. Cl. 562—589 1 Claim

1. The solid crystalline substance calcium ammonium lactate dihydrate having monolithic symmetry.

4,420,637

META-PHENYLENEDIAMINES

Andree Bugaut, Boulogne, and Jean-Jacques Vandenbossche, Aulnay-sous-Bois, both of France, assignors to L'Oreal, Paris, France

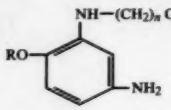
Filed Jul. 2, 1979, Ser. No. 53,813

Claims priority, application France, Jul. 12, 1978, 78 20848

Int. Cl.³ C07C *91/40, 91/42*

U.S. Cl. 564—443 34 Claims

1. A compound of the general formula



(I)

in which R represents an alkyl radical containing from 1 to 4 carbon atoms and n is an integer of from 1 to 3, or an acid salt thereof.

4,420,638

FLUORINATED ETHER-KETONES

Ronald E. Uschold, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 2, 1982, Ser. No. 353,816

Int. Cl.³ C07C *49/175, 49/227*

U.S. Cl. 568—415 5 Claims

1. Compound of the formula

$$CF_2XCFX^1O[CF_2CF(CF_3)O]_{n-1}CF_2C(O)CF_3$$

wherein n is an integer and is 1 to 6 and X and X^1 are both Cl or X is F or OR wherein R is methyl, alkyl of 2 to 6 carbon atoms, alkyl of 2 to 6 carbon atoms interrupted with ether oxygen, cyclohexyl or phenyl and X^1 is H.

4. Compound of the formula

$$CFCl{=}CFO[CF_2CF(CF_3)O]_{n-1}CF_2C(O)CF_3$$

wherein n is an integer and is 1 to 6.

4,420,639

AROMATIC COMPOUNDS

Anthony W. Lake, Guildford Surrey, and Carl J. Rose, London, both of England, assignors to Beecham Group Limited, England

Continuation of Ser. No. 955,197, Oct. 27, 1978, abandoned, which is a continuation of Ser. No. 795,119, May 9, 1977, which is a division of Ser. No. 748,676, Dec. 8, 1976, Pat. No. 4,061,799, which is a continuation-in-part of Ser. No. 563,159, Mar. 28, 1975, abandoned, which is a division of Ser. No. 501,733, Aug. 29, 1974, abandoned. This application Nov. 12, 1981, Ser. No. 320,190

Claims priority, application United Kingdom, Sep. 11, 1973, 42550/73

Int. Cl.³ C07C *49/215*

U.S. Cl. 568—328 4 Claims

4. 4-(6'-Methoxy-2'-naphthyl)butan-2-one.

4,420,640

METHOD OF PRODUCING 1,9-NONANEDIAL AND 9-HYDROXY-7-NONEN-1-AL

Mitsuo Matsumoto; Noriaki Yoshimura, and Masuhiko Tamura, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 27, 1982, Ser. No. 372,337

Claims priority, application Japan, Apr. 30, 1981, 56-66367; May 26, 1981, 56-80642

Int. Cl.³ C07C 45/50

U.S. Cl. 568—454 6 Claims

1. A method of producing 1,9-nonanedial which comprises reacting 2,7-octadien-1-ol with a mixture of hydrogen and carbon monoxide in an organic solvent in the presence of a rhodium catalyst and 30–300 equivalents of a monodentate tertiary organic phosphorus compound per gram atom of rhodium at a hydrogen partial pressure of 0.5–20 kg/cm^2 (absolute) and a carbon monoxide partial pressure of 0.1–5.0 kg/cm^2 (absolute), wherein said reacting is carried out at a temperature of 40°–130° C.

4,420,641

FORMALDEHYDE PRODUCTION

H. Robert Gerberich, and Eldred T. Smith, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 287,385, Jul. 27, 1981. This application Jan. 12, 1983, Ser. No. 457,335

Int. Cl.³ C07C 47/052

U.S. Cl. 568—473 21 Claims

1. In a process for the production of formaldehyde by oxidative dehydrogenation of methanol vapor with oxygen gas at elevated temperatures from about 500° C. to about 700° C., the improvement comprising passing a vapor mixture comprising methanol and an oxygen-containing gas over a catalyst comprising lead and silver on a support having a surface area below about 5 m^2/g, the weight ratio of lead to silver ranging from about 0.005 to about 0.15.

4,420,642

SELECTIVE REMOVAL AND RECOVERY OF CATECHOL MIXED WITH 2-METHALLYLOXYPHENOL

Borivoj R. Franko-Filipasic, Morrisville, Pa., and James Snyder, Yardville, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 18, 1982, Ser. No. 349,810

Int. Cl.³ C07C 37/86

U.S. Cl. 568—753 7 Claims

1. A process for selectively removing unreacted catechol from a mixture comprising catechol, 2-methallyloxyphenol, reaction salts, and an organic solvent comprising treating said mixture with an aqueous solution of a base selected from an alkali metal hydroxide or carbonate, the aqueous solution comprising from 2 to 2.5 equivalents of base per mole of catechol present in said mixture, separating the resulting aqueous phase from the resulting organic phase, then recovering catechol from the aqueous phase.

4,420,643

EXTRACTION OF PHENOLS FROM AQUEOUS SOLUTIONS

Christos Savides, Somerville, and John H. Bright, Kendall Park, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 30, 1982, Ser. No. 429,907

Int. Cl.³ C07C 37/68

U.S. Cl. 568—753 7 Claims

1. A process for the extraction of at least one mono- or polyhydric phenolic compound from aqueous solutions which comprises: (a) contacting said aqueous solution with an organic solution comprising (i) at least one tertiary phosphine oxide compound, represented by the formula:

wherein R_1, R_2, and R_3 individually represent alkyl groups containing from 1 to 20 carbon atoms, provided that at least two of said R groups contain 6 or more carbon atoms, and (ii) a C_{10} to C_{16} alkyl-substituted aromatic hydrocarbon having a boiling point of at least about 200° C.; and (b) separating the organic phase from the aqueous phase.

4,420,644

LIGNIN HYDROCRACKING PROCESS TO PRODUCE PHENOL AND BENZENE

Derk T. A. Huibers, Pennington, and Hugh J. Parkhurst, Jr., Plainsboro, both of N.J., assignors to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Aug. 24, 1981, Ser. No. 295,459

Int. Cl.³ C07C 37/00

U.S. Cl. 568—806 9 Claims

1. A process for hydrocracking lignin-containing feed materials to produce mono-aromatic phenolic products, comprising:

(a) mixing the lignin-containing feed with sufficient process-derived slurrying oil to provide a pumpable slurry mixture;

(b) feeding the lignin and oil slurry with hydrogen into a hydrocracking reaction zone containing an ebullated bed of particulate catalyst;

(c) maintaining said catalytic reaction zone at temperature within range of 650°–850° F., hydrogen partial pressure of 500–2500 psig, and space velocity within the range of 0.1–10 wt./hr./wt. catalyst;

(d) phase separating the reaction zone effluent stream to recover a hydrogen-containing gas stream and aromatic oils having normal boiling range of 500°–900° F. as said slurrying oil; and

(e) withdrawing a mono-aromatic liquid product stream boiling below about 500° F. and containing at least about 25 W % phenolic product.

4,420,645

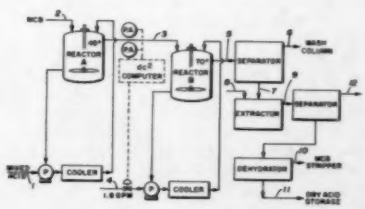
PROCESS FOR THE NITRATION OF HALOBENZENES

Kumbakonam R. Vaidyanathan, Creve Coeur, Mo., assignor to Monsanto Company

Filed Jul. 19, 1982, Ser. No. 399,637

Int. Cl.³ C07C 79/12

U.S. Cl. 568—937 10 Claims



1. In a continuous process for the production of nitrohalobenzene from monohalobenzene by reacting monohalobenzene with nitric acid and a second acid selected from the group consisting of sulfuric acid, phosphoric acid, sulfonic acid and mixtures of the above, the improvement comprising:

(1) feeding nitric acid, the second acid and an excess over the stoichiometrically required monohalobenzene to a first

reactor with controlled cooling so as to obtain a conversion of at least about 75% of the nitric acid, and

(2) continuously feeding the reaction product of (1) into a second reactor into which is also continuously fed the proportion of the second acid stoichiometrically required as of the time of feeding the reaction product of (1) into the second reactor, with controlled cooling so as to obtain a conversion of at least about 98% of the nitric acid.

4,420,646

FEEDSTOCKS FOR THE PRODUCTION OF SYNTHETIC LUBRICANTS

Jerome W. Darden; Lewis W. Watts, Jr., and Edward T. Marquis, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 28, 1982, Ser. No. 372,491
Int. Cl.³ C07C *1/16, 3/18*
U.S. Cl. 585—10 **10 Claims**

1. A process for oligomerizing mono olefins comprising contacting a mixture of alpha olefins and internal olefins comprising greater than 50 and less than 99 weight percent of internal olefins where both the alpha and internal olefins each have between 9 and 24 carbon atoms, inclusive, and the alpha and internal olefins have carbon numbers identical to or within one carbon number of each other and in which the internal olefins have the double bond randomly distributed, with a catalyst comprising boron trifluoride and a protonic promoter under oligomerization conditions to produce a crude oligomer product, removing only the unreacted monomer and hydrogenating the remainder.

3. A synthetic lubricant component having a viscosity at 210° F. of between 3.5 and 5.0 centistokes, a viscosity at 25° C. of between 25 and 40 centistokes, a viscosity index of greater than 100 and a thermogravimetric analysis value of greater than 80 weight percent, being produced by oligomerizing a mixture of alpha olefins and internal olefins having greater than 50 but less than 99 weight percent of internal olefins and both alpha and internal olefins each having between 9 and 24 carbon atoms, inclusive, and the alpha and internal olefins have carbon numbers identical to or within one carbon number of each other and in which the internal olefins have the double bond randomly distributed, by means of reacting the mixture of olefins in the presence of boron trifluoride catalyst and a protonic promoter at a temperature between 25° and 150° C. to produce a crude oligomer product, removing only the unreacted monomer and hydrogenating the remainder.

4,420,647

SEMI-SYNTHETIC LUBRICATING OIL COMPOSITION

Kenneth G. Hammond, Poughkeepsie; Joseph C. Sendra, Fishkill, both of N.Y.; Lewis W. Watts, Jr., Austin, Tex.; Edward T. Marquis, Austin, Tex., and John M. Larkin, Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,859
Int. Cl.³ C10M *1/18; C07C 1/16, 3/18*
U.S. Cl. 585—10 **23 Claims**

1. A lubricating oil composition comprising

a. a major portion of a synthetic lubricant component or a mixture of the synthetic lubricant component and a lubricating hydrocarbon mineral base oil, the synthetic lubricant component being made by contacting a mixture of olefins having between 9 and 24 carbon atoms, inclusive, and having greater than 50 weight percent internal olefins, where the double bond of the olefin is randomly distributed throughout the carbon chain, the balance being alpha olefins, with a catalyst comprising boron trifluoride at a temperature between about 25° and about 150° C. sufficient to effect oligomerization of said olefins, then hydrogenating the oligomerized olefins to make the synthetic lubricant component, and

b. minor portions of additive components.

4,420,648

PROCESS FOR HYDROGENATING ORGANIC COMPOUNDS WITH A SUPPORTED COBALT-SILICA COPRECIPITATED HYDROGENATION CATALYST

James L. Carter, and Allan E. Barnett, both of Westfield, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 514, Jan. 2, 1979, abandoned. This application Sep. 19, 1979, Ser. No. 77,011
Int. Cl.³ C07C *5/10*
U.S. Cl. 585—269 **11 Claims**

1. A process for hydrogenating organic compounds which comprises contacting at least one hydrogenatable organic compound with hydrogen in the presence of a calcined and reduced coprecipitated catalyst consisting essentially of cobalt, silica, and solid porous particles, said catalyst being characterized as having a B.E.T. total surface area ranging from about 150 to about 350 m^2/g and a reduced metal surface area ranging from about 5 to about 20 m^2/g as determined by hydrogen chemisorption, after reduction at 400° C., wherein the amount of cobalt in the catalyst ranges from about 25 wt. % to about 70 wt. % based on the total weight of the calcined and reduced catalyst, wherein said catalyst has been prepared by coprecipitating cobalt and silicate ions in the presence of said solid porous particles.

4,420,649

HYDROCARBON DEHYDROGENATION WITH A MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plains, Ill.

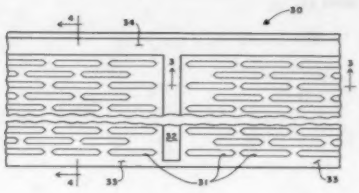
Division of Ser. No. 301,065, Sep. 11, 1981, Pat. No. 4,396,540, which is a continuation-in-part of Ser. No. 246,828, Mar. 23, 1981, Pat. No. 4,358,399, which is a division of Ser. No. 82,436, Oct. 5, 1979, Pat. No. 4,268,377, which is a continuation-in-part of Ser. No. 848,699, Nov. 4, 1977, Pat. No. 4,183,804. This application Feb. 7, 1983, Ser. No. 464,437
Int. Cl.³ C07C *5/36, 5/40;* B01J *27/08*
U.S. Cl. 585—434 **15 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at hydrocarbon dehydrogenation conditions, with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed ruthenium carbonyl component with a porous carrier material containing a uniform dispersion of a catalytically effective amount of a platinum group component maintained in the elemental metallic state during the incorporation and pyrolysis of the ruthenium carbonyl component, and of a rhenium component.

4,420,650
WEDGED CHANNEL VERTICAL JUNCTION SILICON SOLAR CELL

Joseph F. Wise, Dayton, and James F. Holt, Medway, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 9, 1982, Ser. No. 356,573
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—255 **3 Claims**

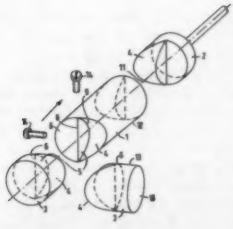


1. A vertical junction solar cell comprising:
a. a semiconductor substrate of predetermined thickness having substantially parallel upper and lower surfaces:
b. a plurality of spaced, electrically conducting strips on said upper surface and separating said upper surface into a plurality of distinct active areas, and an electrical header strip joining said conducting strips to provide a first electrical contact for said cell;
c. a second electrical contact on said lower surface; and
d. a multiplicity of channels formed in each of said active areas, said channels having a depth substantially less than said substrate thickness and being arranged along the lengths thereof in substantially parallel rows, each row comprising a plurality of said channels defined by a plurality of thin vertical ribs of said substrate between adjacent rows which include the vertical junctions of said cell, and by a plurality of regions of said substrate between proximate ends of said channels in each row, each of said channels in each row having adjacent thereto and near its midpoint at least one said region of an adjacent row, whereby each of said channels in each row is offset with respect to corresponding channels in the adjacent rows.

4,420,651
PROXIMITY SWITCH OPERABLE WITHOUT PHYSICAL CONTACT

Dieter Teich, Schwandorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 18, 1981, Ser. No. 294,035
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033750
Int. Cl.³ H05K *5/00*
U.S. Cl. 174—50 **2 Claims**

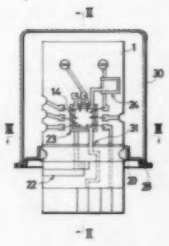


1. In a proximity switch which can be operated without physical contact and which comprises an elongate, columnar housing having at least one lateral wall lying parallel to and spaced a predetermined distance from the principal axis of the housing, the housing being symmetrical about two orthogonal axes of symmetry which are perpendicular to the principal axis, and the housing having at least two parts which are joined at abutting surfaces which intersect the principal axis at an angle, the improvement in which:
the abutting surfaces joining the parts each comprise first, second and third abutting surfaces, the first surface being parallel to the principal axis, and the second and third surfaces each intersecting the first surface at an angle of 90°, the greatest dimension of the first abutting surface, measured in the direction of the principal axis, being equal to the shortest distance from the principal axis to the lateral wall;
the housing is circular in cross section; and
the first abutting surface is joined to the second abutting surface along a straight line and to the third abutting surface along a semicircle, the area of the first surface being equal to half the cross-sectional area of the housing.

4,420,652
HERMETICALLY SEALED PACKAGE

Hitoshi Ikeno, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1981, Ser. No. 297,411
Claims priority, application Japan, Sep. 2, 1980, 55-121624
Int. Cl.³ H05K *5/06*
U.S. Cl. 174—52 H **2 Claims**



1. A hermetically sealed package comprising: a shell having a through hole; a circuit board consisting of a sealed part, a fixed part and a projecting part, and having a circuit pattern extending from said sealed part through said fixed part to said projecting part on at least one surface thereof, and being inserted into said through hole; a non-conductive fixing material fixing hermetically said fixed part of said circuit board into said through hole of said shell; and a can fixed hermetically to said shell, and sealing said sealed part of said circuit board together with said shell.

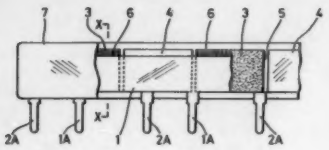
4,420,653
HIGH CAPACITANCE BUS BAR AND METHOD OF MANUFACTURE THEREOF

Sunichi Fukuda, Kukizaki, and Masaaki Muto, Ryugasaki, both of Japan, assignors to Rogers Corporation, Rogers, Conn.

Filed May 29, 1980, Ser. No. 154,376
Int. Cl.³ H01B *7/08*
U.S. Cl. 174—72 B **19 Claims**

18. A bus bar comprising:
at least a pair of elongated, flat, parallel conductors;
a layer of insulating material bonded to facing surfaces of each of said conductors;
a plurality of flat rectangular dielectric elements sandwiched between said layers of insulating material, said dielectric elements having oppositely disposed metallized faces and being spacially separated;
means establishing electrical connection between an exposed

edge portion of each of said conductors and an adjacent metallized face of said dielectric elements, said connection



establishing means bridging the layers of insulating material.

4,420,654

CABLE SLEEVE SEALING ASSEMBLY

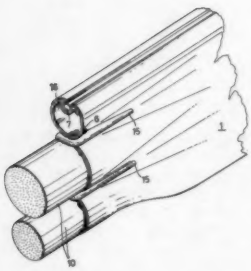
Siegfried Müller, Vollmannstr. 25, 5800 Hagen 8, Fed. Rep. of Germany

Continuation of Ser. No. 127,857, Mar. 6, 1980. This application Feb. 8, 1982, Ser. No. 347,049

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1979, 2909979; Jul. 11, 1979, 2927878

Int. Cl.³ H02G 15/196

U.S. Cl. 174—92 8 Claims



1. An assembly encasing in a sealed arrangement an item such as a cable or the like comprising:

an essentially tubular slotted casing consisting essentially of thermally shrinkable material having a pair of longitudinal edges;

said casing being shrunk by application of heat thereto to encase in sealing engagement therein said item;

first and second fastening means extending longitudinally of said casing alongside each of said longitudinal edges, respectively; and

a tubular annular slotted clamping element arranged with a pair of longitudinal clamping edges engaging therebetween both said first and second fastening means to hold said fastening means together during formation of said assembly;

said clamping element being encased within said casing thereby to enhance the clamping effect of said clamping element upon said fastening means by the action thereon of said heat shrunk casing.

4,420,655

CIRCUIT TO COMPENSATE FOR DEFICIT OF OUTPUT CHARACTERISTICS OF A MICROPHONE BY OUTPUT CHARACTERISTICS OF ASSOCIATED OTHER MICROPHONES

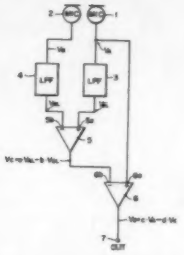
Takuya Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 25, 1981, Ser. No. 277,077

Claims priority, application Japan, Jul. 2, 1980, 55-90333

Int. Cl.³ H04B 15/00

U.S. Cl. 381—94 12 Claims



1. A microphone system including a main microphone and a sub-microphone for compensating for frequency characteristics of the main microphone, the system further including:

first and second input terminals for receiving outputs of said main and sub-microphones, respectively;

detecting means for detecting a difference in the outputs of said main and sub-microphones;

compensating means for carrying out subtraction between the output of the detecting means and the output of said main microphone so as to compensate for output frequency characteristics of the output of said main microphone;

an output terminal connected to said compensating means; wherein:

said main microphone is one selected from a group consisting of a type operating in pressure gradient mode, and a type operating in both pressure gradient mode and pressure mode; and said sub-microphone is one operating in pressure mode; and wherein:

said main and sub-microphones are disposed close to each other to receive a substantially same acoustic input to deliver outputs of a same phase, respectively.

4,420,656

INTERACTIVE TELEPHONE ANSWERING SYSTEM

Michael Freeman, 31 Cornwall La., Sands Point, N.Y. 11050

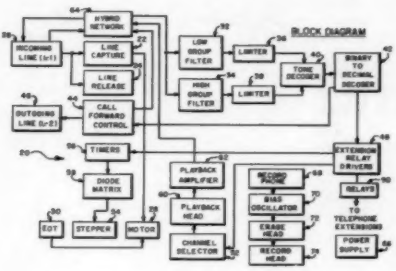
Continuation-in-part of Ser. No. 97,687, Nov. 27, 1979, Pat. No. 4,320,256. This application Aug. 24, 1981, Ser. No. 295,817

Int. Cl.³ H04M 1/64, 3/00

U.S. Cl. 179—6.04 22 Claims

1. An interactive telephone answering system connectable to a capturable telephone line and responsive to unique signals transmitted over said telephone line after capture thereof for enabling caller selectible routing of an incoming call to a desired receiving telephone in accordance with a verbally interactive prerecorded decision tree format, said system comprising line capture and release means responsive to an incoming telephone call for initially capturing said telephone line and providing a message start signal; multitrack message reproduction means connectable to said line capture means for selectively transmitting prerecorded audio messages to said caller over said captured telephone line, said multitrack message reproduction means comprising a multitrack magnetic storage medium for providing a plurality of different selectible audio messages in a variable decision tree format, at least one of said selectible tracks in said decision tree format comprising an

arming signal associated with an ultimate branch of a caller selectible decision tree, each of said caller selectible decision trees comprising a primary interrogatory audio message and a time related derivative ultimate branch response comprising said arming signal, said storage medium comprising a plurality of coextensive tracks having said audio message and ultimate branch response stored thereon for selectible playback, therefrom, said coextensive tracks comprising audio tracks storing audio information thereon in a pluraity of reproducible information segments, each of said segments comprising a complete message reproducible directly in response to selective playback of said track upon which said segments are stored, at least one of said tracks stored information comprising said primary interrogatory message and associated multiple choice selectible derivative secondary interrogatory containing messages related in content to said primary interrogatory message, at least a first plurality of said other tracks comprising derivative secondary interrogatory containing messages related in real time and content to said one track primary interrogatory message and corresponding to said associated multiple choice selectible derivative secondary interrogatory containing messages, each of said first plurality of said other tracks comprising a different derivative secondary interrogatory containing message, said first plurality of said other tracks further comprising associated multiple choice selectible responsive messages related in real time and content to each of said derivative secondary interrogatory containing messages, only one of said first



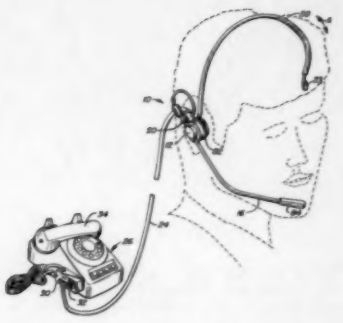
plurality of said other tracks comprising a unique selectible responsive message to a particular one of said real time related derivative secondary interrogatory messages, said derivative secondary interrogatory messages being chain linked in content to said primary interrogatory message for forming said caller selectible decision tree for ultimately directing a telephone caller to said ultimate branch on said selected decision tree, said multitrack message reproduction means further comprising multitrack audio playback means for selectively transmitting said audio message from said storage medium over said captured telephone line, each of said plurality of tracks having a unique associated track selection signal corresponding to one of said unique signals transmitted over said captured telephone line; signal discriminator and track selection means operatively connected between said line capture means and said multitrack message reproduction means for enabling reception of said unique signals transmitted over said captured telephone line and selection of one of said plurality of tracks for selective playback thereof in response to reception and discrimination of the unique signal corresponding thereto; and telephone connection means operatively connected between said line capture and release means and said multitrack message reproduction means for connecting said telephone line to said receiving telephone in response to detection of said arming signal associated with said ultimate caller selectible branch, whereby a caller responsive verbally interactive telephone call routing system is provided.

4,420,657

ADJUSTABLE HEADSET

Wallace K. Larkin, Scotts Valley, Calif., assignor to ACS Communications, Inc., Scotts Valley, Calif.

Filed Oct. 29, 1981, Ser. No. 316,230
Int. Cl.³ H04R *23/00*; H04M *1/03, 1/04*
U.S. Cl. 179—156 A **18 Claims**



1. A lightweight, adjustable headset for use with a communication device comprising:

a generally cylindrical housing with one end thereof including a sound port;

a receiver element disposed within the housing for converting electrical signals into sound waves audible to the user;

a microphone boom, with the boom being generally L-shaped, with one end of the boom being fixed to the end of the housing opposed to the sound port;

a microphone element, connected to the free end of the boom for converting sound waves into electrical signals;

wire means providing discrete connections between the communications device and the microphone and receiver elements respectively;

support means for holding said housing in a selected position relative to the head of the user, with the support means being defined by a U-shaped wire band connected to the housing and having dimensions substantially corresponding to the user's head; and

cylindrical cushion means, with one end thereof being affixed to the end of the housing having the sound port and configured to rest against the user's ear, said cushion means including a channel aligned with said sound port, said cushion means further including an elongated hollow plug mounted in said channel to permit sound to pass from the housing to the user's ear, with the cushion means having a diameter greater than the diameter of the auditory canal of the user's ear such that the sound port of the housing is spaced away from the auditory canal of the ear thereby reducing the likelihood of infection and permitting dissipation of sound surges, and wherein the diameter of the cushion means is small enough to enable the cushion means to be received within the outer perimeter of the user's earlap whereby the cushion means functions as a load bearing support and as a pivot point to permit the adjustment of the position of the headset relative to the user's head.

4,420,658

MULTIPLE TONE SIGNAL SYSTEM

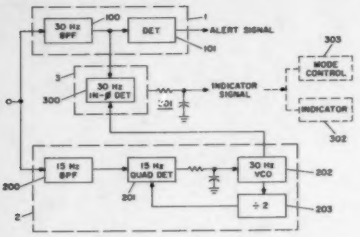
Bernard D. Loughlin, Centerport, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed May 4, 1981, Ser. No. 260,645
Int. Cl.³ H04H *5/00*
U.S. Cl. 381—15 **6 Claims**

1. In an AM multiphonic radio receiver, apparatus for de-

tecting the presence of first and second low frequency pilot signals which are interrelated in frequency and phase and which are modulated on the AM carrier wave along with the multiphonic program information, said apparatus comprising:

(a) first means for detecting the presence of the first pilot signal in the modulation of a received AM radio wave and providing a first detection signal in response thereto;



(b) second means for detecting the presence of the second pilot signal in the modulation of said received AM radio wave and providing a second detection signal in response thereto; and

(c) third means responsive to said first and second detection signals for determining whether said first pilot signal and said second pilot signal are present and in a predetermined phase relationship, and if so then providing an indicator signal indicating the reception of a multiphonic broadcast.

4,420,659

BI-STABLE MECHANISM AND ANTI-THEFT DEVICE FOR A MOTOR VEHICLE COMPRISING SUCH MECHANISM

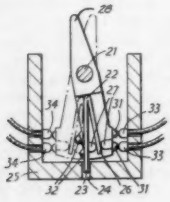
Guy Neyret, Oullins, France, assignor to Sodex Magister, Societe d'Exploitation des Brevets. Neiman, Croissy, France

Division of Ser. No. 212,774, Dec. 4, 1980, Pat. No. 4,350,852. This application Mar. 29, 1982, Ser. No. 363,206

Claims priority, application France, Dec. 7, 1979, 79 30061

Int. Cl.³ H01H *5/04*

U.S. Cl. 200—67 A **4 Claims**



1. A bi-stable mechanism comprising:

(a) a housing having one wall provided with a hole therein and other walls providing abutmenis,

(b) a lever pivotally mounted between its ends in said housing about an axis and movable between first and second stable positions determined by engagement of the lever with said abutments, said lever having a recess therein formed by a reduced thickness of the lever on one side of said axis, and

(c) a spring for urging said lever towards one of said stable positions according to selection, said spring being of a hairpin type spring of which the end of the first leg is engaged in said hole so as to be pivotable therein about the axis of said first leg and the end of the second leg is connected with the lever, said spring being located in said recess, the arrangement being such that movement of the lever pivots the spring about the pivotal axis of said first leg, the distance between the said ends of the legs of the spring when the lever is in either stable position is greater than the distance between said end of the first leg of the spring and the point of engagement of the end of the other leg of the spring with the lever when the lever is at its center position whereby the spring becomes more compressed as the lever approaches the center position where the lever is unstable and wherein the first leg is perpendicular to the axis of said lever.

4,420,660

CIRCUIT BREAKER

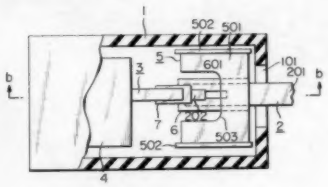
Fumiyuki Hisatsune; Shinji Yamagata; Junichi Terachi, all of Fukuyama, and Hajimu Yoshiyasu, Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1982, Ser. No. 350,174

Claims priority, application Japan, Feb. 26, 1981, 56-27927; Feb. 27, 1981, 56-29660

Int. Cl.³ H01H *9/30*

U.S. Cl. 200—144 R **4 Claims**



1. A circuit breaker comprising:

a pair of contactors each of which has a conductor and a contact secured thereto, said contacts abutting each other when said conductors are close to each other, one of said contactors being fixed and the other being movable away from and toward said one contactor to open and close an electric circuit,

arc shields of a material having a resistivity greater than the material of said conductors and said contacts, one positioned on each of said contactors surrounding the periphery of said contacts, for narrowing the arc generated between said contacts when said contacts separate,

at least said shield on said fixed contactor having an arc running groove therein, one end of which is adjacent to the contact therewithin and which has a width no greater than that of said contact, and extending away from said contact in a direction in which the arc formed between said contacts runs when said contacts separate, and

an arc extinguishing plate assembly having a row of a plurality of arc extinguishing plates for extinguishing an arc produced between said contacts when said contacts separate, said plate assembly being positioned adjacent the other end of said arc running groove in said fixed contactor and the other end of said arc running groove extending to a position at which the edges of the plates in said arc extinguishing plate assembly which are toward said contacts overlie the other end of said arc running groove.

4,420,661

SWITCHING MECHANISM WITH A VACUUM CIRCUIT BREAKER BETWEEN A BUS BAR AND A CABLE CONNECTION PIECE

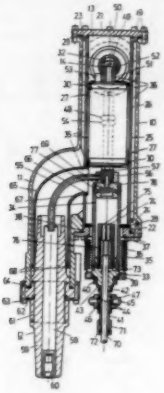
Arnold Efinger, Trossingen, and Erwin Moser, Karlsruhe-Rüppurr, both of Fed. Rep. of Germany, assignors to Wickmann-Werke Böblingen GmbH, Böblingen, Fed. Rep. of Germany

Filed Mar. 30, 1982, Ser. No. 363,508

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112776

Int. Cl.³ H01H *33/66*

U.S. Cl. 200—144 B 7 Claims



1. A switching mechanism, comprising:

a bus bar having an inner conductor and a tubular outer sleeve piece;

a cable connection having an inner conductor;

a vacuum circuit breaker having a vacuum container and being arranged between said bus bar and said cable connection; said vacuum circuit breaker having an immovable contact having an end projecting from said vacuum container and fastened transversely to said inner conductor of said bus bar; said vacuum circuit breaker also having a movable counter contact connected to said inner conductor of said cable connection;

an insulating body associated with said counter contact for axially actuating same;

an electrically conductive outer sleeve which includes a rigid cylindrical tube having at one end a branch for receiving said cable connection, and at the other end a T-shaped base part for receiving a portion of said inner conductor of said bus bar; said tubular outer sleeve of said bus bar being flanged to one arm of said T-shaped base part, and an end cover being flanged to the other arm of said base part;

an electrically insulated inner sleeve which forms a support structure for coaxial fixation of those conductor parts which form the current path, namely said inner conductor of said bus bar, said immovable contact of said vacuum circuit breaker, and said movable counter contact thereof; and

an insulating oil bed for said conductor parts which form the current path, said insulating oil bed separating said electrically conductive outer sleeve and said electrically insulated inner sleeve from each other.

4,420,662

COMPRESSED-GAS CIRCUIT BREAKER

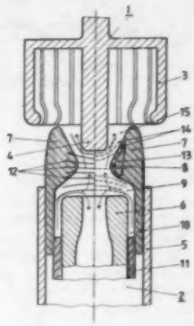
Lutz Niemeyer, and Klaus Ragaller, both of Schweiz, Switzerland, assignors to BBC Brown, Boveri & Company Ltd., Switzerland

Filed Oct. 29, 1981, Ser. No. 316,518

Claims priority, application Switzerland, Oct. 31, 1980, 8102/80

Int. Cl.³ H01H *33/70, 33/10*

U.S. Cl. 200—148 R 9 Claims



1. Compressed-gas circuit breaker comprising two contact members which move relative to one another, a nozzle which is made of dielectric material and is attached to a first member of the two contact members, means for causing compressed gas to flow through the constriction of the nozzle, from a compression-space into an expansion-space, the gas being used for extinguishing the arc which occurs on operating the circuit breaker, and at least one annular insert at the nozzle constriction, the insert being arranged so that it is electrically isolated with respect to the two contact members and is capable of assuming a potential unrelated to the potential of either of said two contact members and exhibits a first capacitance with respect to the first contact member and a second capacitance with respect to the second contact member, magnitudes of the capacitances being chosen, by suitable arrangement and dimensioning of the insert, so that an electric field, and is formed on applying a voltage between the contact members, is displaced, in the region of the nozzle construction, at least partially from the surface of the nozzle, into the compression-space and into the expansion-space.

4,420,663

MATERIAL FOR ELECTRICAL DEVICES HAVING A FLEXIBLE MEMBER

Willis A. Larson, Crystal Lake, and Edwina K. Dulen, Fox Lake, both of Ill., assignors to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Dec. 8, 1980, Ser. No. 213,948

Int. Cl.³ H01H *3/12, 9/24*

U.S. Cl. 200—159 B 7 Claims

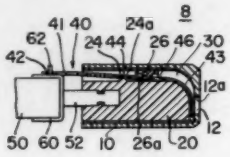
1. An electrical switch having a flexible component made of paper said flexible component having electrical conductive areas printed thereon.

4,420,664

DISPLAY TYPE PUSH BUTTON

Toshihiro Takahashi, Tsurugashima, Japan, assignor to Teko Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1983, Ser. No. 460,049
Claims priority, application Japan, Jan. 25, 1982, 57-8322[U]
Int. Cl.³ H01H 9/16
U.S. Cl. 200—308 3 Claims



1. A display type push button which comprises a push button body having a display window on the front end thereof, a passage which is extended, in the form of a curve, from the rear end of said push button body to said window, and a display plate made of elastic material, said display plate being laid in said passage in such a manner as to reciprocate along said passage and having a stationary end portion which is secured to a switch body, so that, when a switch is turned on and off by operating said push button coupled thereto, said display plate displays the operations of said switch with the free end portion thereof going to and from said window; in which

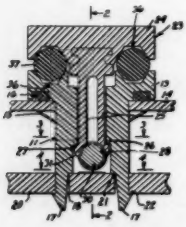
said push button body has first and second protrusions which are protruded into said passage in the opposite directions and are spaced away from each other in the direction of movement of said display plate, and said display plate has first and second through-holes, in such a manner that, as said display plate reciprocates along said passage, at a first position said first protrusion is engaged with said first through-hole while said display plate is depressed by said second protrusion, and at a second position said second protrusion is engaged with said second through-hole while said display plate is depressed by said first protrusion so that said display plate is rocked with said stationary end portion as a fulcrum.

4,420,665

MOISTURE PROOF SWITCH ASSEMBLY

Richard A. Conrad, 1422 Phillips St., Vista, Calif. 92083

Filed Sep. 15, 1982, Ser. No. 418,441
Int. Cl.³ H01H 13/06
U.S. Cl. 200—302 8 Claims



1. A moisture proof switch assembly comprising housing means,

a pair of electrical contacts carried by said housing means,

a switch member including a push button portion and a pair of jaws extending from said push button portion into said housing means,

an electric contact member removably carried by said jaws,

an annular sealing member of elastomeric material surrounding said jaws and interposed between said housing means and said push button portion,

at least one locking shoulder on said housing means,

a latching shoulder on at least one of said jaws engagable with said locking shoulder for maintaining said sealing member compressed between said housing means and said push button portion whereby to seal said housing means from entrance of moisture therein,

said push button portion being depressible whereby to further compress said sealing member and to cause said contact member to engage said contacts,

one of said jaws being flexible relative to the other to disengage said latching shoulder from said locking shoulder, and

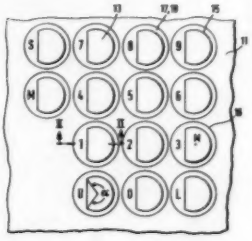
said contact member when carried by said jaws preventing said one jaw from disengaging said latching shoulder from said locking shoulder.

4,420,666

ELECTRICAL KEY CONTACT

Gerd Kammerer, St. Georgen, Fed. Rep. of Germany, assignor to Dieter Graesslin Feinwerktechnik, St. Georgen, Fed. Rep. of Germany

Filed Jun. 4, 1981, Ser. No. 270,312
Int. Cl.³ H01H 9/18, 13/14
U.S. Cl. 200—340 9 Claims



1. In a key pad apparatus which includes a generally planar cover plate having an opening therethrough, electrical switch means supported on one side of said cover plate and having a key button which is supported for movement in directions generally perpendicular to said cover plate, projects through said opening therein, and has a cross section substantially coincident in size and shape with said opening, movement of said key button effecting operation of said switch means, and means defining indicia near said key button on the side of said cover plate opposite said one side, the improvement comprising wherein said cover plate has first and second regions which each have the shape of a closed geometric figure, said second region being a portion of, having a size slightly smaller than, and being substantially centered in said first region and being defined by complementary first and second portions, the perimeters of said first and second portions each having a portion which is coincident with a respective portion of said closed geometric figure which bounds said second region, said opening through said cover plate and said first portion of said second region thereof being coincident, said first region of said cover plate being curved and lying out of the plane of said cover plate, and said indicia being provided within said second portion of said second region.

4,420,667

INDUCTION HEATING METHOD AND APPARATUS FOR ELONGATED WORKPIECES

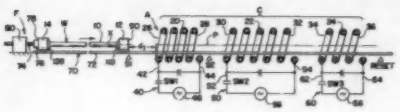
John C. Lewis, Dundas, Canada, assignor to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Filed Jun. 21, 1982, Ser. No. 390,409
Int. Cl.³ H05B 5/00
U.S. Cl. 219—10.41 5 Claims

3. A method of inductively heating to a substantially uniform

surface temperature an elongated workpiece having a longitudinal axis and formed with an intermediate extended length portion of substantially uniform cross-sectional shape throughout and relatively short axially spaced, leading and trailing end portions of enlarged cross-sectional shape, which method comprises the steps of:

(a) axially moving the said workpiece continuously at a given rate of speed coaxially of and sequentially through a succession of first, second, and third axially aligned multiturn induction heating coils, and



(b) actuating a time delay circuit control means for said coils, when the said leading end portion of the advancing workpiece reaches a predetermined pre-entry distance from the entrance end of said first coil, to progressively effect the energization of the said first coil only during passage threthrough of the said leading end portion of the workpiece, the energization of the said second coil only during passage therethrough of said intermediate portion of the workpiece, and the energization of the said third coil only during passage therethrough of the said trailing end portion of the workpiece.

4,420,668

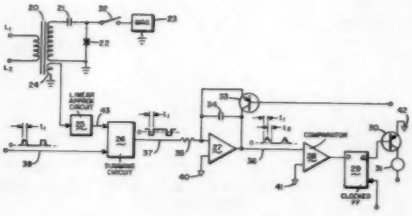
CONSTANT POWER MICROWAVE OVEN

Gerald L. Larson, Minnetonka; Robert L. Ellis, Brooklyn Park, and Daniel A. Baker, St. Louis Park, all of Minn., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jun. 25, 1981, Ser. No. 277,459

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 B **9 Claims**



1. In a microwave oven including a magnetron for transmitting microwave energy to a cooking cavity, a power supply for driving the magnetron, and a controller having stored food cooking data corresponding to a plurality of food types and masses, the improvement comprising: means for measuring the power supplied to said magnetron; means for comparing said measured power to a predetermined desired average power corresponding to one of said plurality of food types and masses, and means to vary the duty cycle of said magnetron to cause the average power supplied to said magnetron to equal said predetermined desired average powers such that the actual cooking time is equal to the predetermined cooking time said one of said plurality of food types and masses.

4,420,669

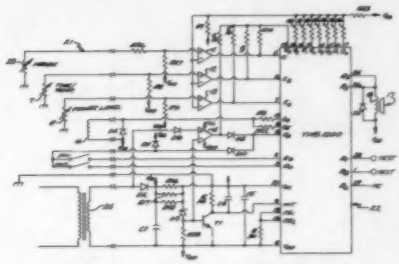
DATA INPUT APPARATUS FOR MICROWAVE OVEN CONTROLLERS

Gerald W. Scalf, Johnson City, Tenn., and James H. Koberlein, Georgetown, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 273,294, Jun. 15, 1981, abandoned. This application Dec. 28, 1981, Ser. No. 335,023

Int. Cl.³ H05B *6/68*; G08C *9/00*

U.S. Cl. 219—10.55 B **3 Claims**



1. Microwave oven control apparatus comprising:

digital electronic processing means having data inputs representative of selected parameters for providing an output based on said parameters,

power supply means for said processing means,

a comparator circuit having first and second inputs and an output,

a first voltage divider comprising a fixed resistor coupled to a potentiometer, the voltage generated by the voltage divider fed to the first input of the comparator, and being representative of a selected parameter,

a second voltage divider comprising a fixed resistor coupled to a binary weighted resistor ladder, and means generating a voltage in the second voltage divider by enabling in turn the resistors of the ladder and feeding the voltage generated in the second voltage divider to the second input of the comparator, the comparator switching from one value to another upon the enablement of one of the resistors of the ladder, and

the output of the comparator connected to the processing means, a second comparator circuit having first and second inputs and an output,

a third voltage divider comprising a fixed resistor coupled to another potentiometer, the voltage generated by the third voltage divider fed to the first input of the second comparator and being representative of a selected parameter,

the voltage generated in the second voltage divider by enabling in turn the resistors of the ladder fed to the second input of the second comparator, the comparator switching from one value to another upon the enablement of one of the resistors of the ladder, and

the output of the second comparator connected to the processing means.

4,420,670

CONTROL FOR DIELECTRIC HEATING IN BLOW MOLDING MACHINE

Fred J. Croswell, Felocity, and Charles P. Shinkle, Bethel, both of Ohio, assignors to Cincinnati Milacron Industries, Inc., Cincinnati, Ohio

Filed Mar. 5, 1982, Ser. No. 355,222

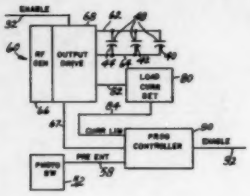
Int. Cl.³ H05B *6/60, 6/50*

U.S. Cl. 219—10.81 **11 Claims**

1. In an apparatus for dielectric heating a plurality of thermoplastic article preforms having heating station, said heating station having a plurality of pairs of electrodes energizable by a radio frequency generator, the generator being provided

with a load current sensor producing a current limit signal at a selectable load current magnitude and an input circuit for selectively energizing and deenergizing the electrodes in response to a control signal, the preforms to be heated being placed between the electrodes of the pairs, an improved control apparatus comprising:

(a) means responsive to the number of preforms resident in the heating station for selecting interval control and current control, current control being selected when the number of resident preforms equals the number of pairs of electrodes;



(b) timing means responsive to the selecting means for producing an interval control signal for application to the input circuit to effect energization of the electrode pairs for a predetermined period of time in response to interval control being selected; and

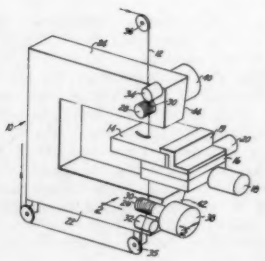
(c) current control means responsive to the selecting means and the current limit signal for producing a current control signal for application to the input circuit to effect energization of the electrode pairs until a predetermined load current magnitude is reached in response to current control being selected.

4,420,671

HELICOIDAL GUIDE FOR WIRE ELECTRODE OF AN EDM APPARATUS

Benno I. Bonga, Crans, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed Sep. 14, 1981, Ser. No. 302,061
Int. Cl.³ B23P *1/08*
U.S. Cl. 219—69 W **13 Claims**



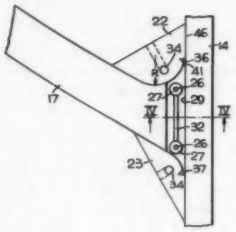
1. An improvement for an EDM apparatus wherein a cut is effected by electrical discharges in a workpiece by means of an electrode tool in the form of an electrically-conductive wire, said apparatus comprising a pair of wire guide and support members each mounted at the end of each of a pair of support arms one disposed on one side and the other on the other side of a machining zone between said workpiece and said wire whereby said wire has a longitudinal axis disposed at an angle relative to said workpiece, and a pair of servo-motors for displacing said pair of support arms and said workpiece relative to each other according to a predetermined path, said improvement comprising at least one of the electrode wire support and guide members being in the form of a rotatable cylindrical member, a helical groove on the peripheral surface of said cylindrical member, said helical groove having a bottom and sidewall surfaces, and a motor for driving said cylindrical member in rotation, whereby said wire is supported and guided by a portion of the surfaces of said helical groove and the angle of said wire relative to said workpiece is varied as a function of the rotation of said cylindrical member having said helical groove on the peripheral surface thereof.

4,420,672

METHOD AND APPARATUS TO PRODUCE ELECTROSLAG T-JOINTS WHERE FILLETS ARE REQUIRED

James R. Nolt, Jr., Mt. Wolf, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 43,006, May 29, 1979, abandoned. This application May 4, 1981, Ser. No. 260,073
Int. Cl.³ B23K *25/00*
U.S. Cl. 219—73.1 **7 Claims**



1. A method of forming a T-joint having fillets of a desired contour between two angularly related members comprising the steps of:

positioning fillet material retaining means along the joint to be formed;

providing fillet material in the joint prior to welding;

providing flux to the joint at one side of the fillet material retaining means;

providing slag relief means in said fillet material retaining means adjacent to the head of the T-joint to be formed;

providing communicating means between the T-joint space and the slag relief means for slag to run into the relief means;

providing electric current to the members to generate heat to melt the base material of the members and the fillet material to a molten state.

4,420,673

ELECTRODES FOR USE IN THE EXTRUSION-FUSION WELDING OF LEAD PARTS THROUGH AN APERTURE IN A BATTERY CASE AND METHOD OF EXTRUDING, FUSING AND FORGING LEAD CONNECTIONS IN BATTERY CASES

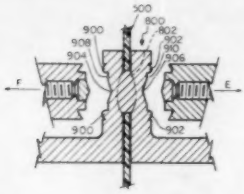
William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation of Ser. No. 29,255, Apr. 11, 1979, Pat. No. 4,346,283, which is a division of Ser. No. 790,881, Apr. 26, 1977, Pat. No. 4,166,210. This application Oct. 20, 1981, Ser. No. 313,139
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.³ B23K *11/30*
U.S. Cl. 219—78.16 **9 Claims**

1. A method of welding lead parts through an aperture in the wall of a battery case to form a connection therethrough, said wall having a substantially flat surface adjacent the perimeter of said aperture, the method comprising the steps of:

(a) positioning said parts on opposing sides of said aperture to at least entirely overlap said aperture;

(b) upsetting at least a portion of said parts into said aperture to touch within said aperture;
(c) passing current through said parts to melt portions of said parts at least within said aperture;
(d) compressing at least said melted portions within said aperture to fill said aperture; and



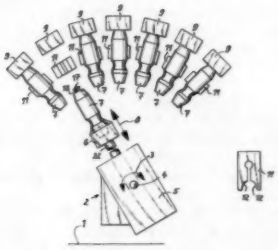
(e) forging unmelted portions of said parts generally surrounding said aperture and opposite said flat surface at least during a portion of said compression step, preventing expulsion of said melted portions.

4,420,674

PROCEDURE AND DEVICE FOR WELDING STUDS AND SIMILAR PARTS TO A WORK PIECE

Ernst G. Jordan, Menden, Fed. Rep. of Germany, assignor to OBO Bettermann OHG, Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 323,727
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1981, 3108840
Int. Cl.³ B23K *9/12, 9/20*
U.S. Cl. 219—99 **16 Claims**



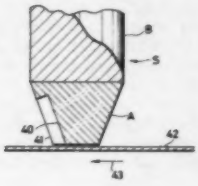
1. A process for welding studs and similar parts to a workpiece by a stud-welding device operating at least semiautomatically, which process comprises supplying studs mechanically from an external source, individually and in weldable position, to a stud holder, holding the stud holder in a stud-holding device, moving it to welding position and welding the held stud, causing the stud-welding device to return the stud holder to transfer position ready to receive another stud; operatively associating a plurality of stud holders with the stud-welding device, alternatively connecting the stud holders to the stud-welding device in accordance with a selectable call-up program, so that a given stud holder equipped with a stud and connected to the stud-welding device is separated from the stud-welding device after the weld has been performed and the transfer position has been reached, and holding it in that position, the above procedural sequence being controlled electrically or electronically.

4,420,675

METHOD FOR MAKING A STYLUS HAVING A CONDUCTIVE CARBON LAYER AND A STYLUS MADE BY THE METHOD

Hideaki Takehara, Fujisawa, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Dec. 1, 1981, Ser. No. 326,391
Claims priority, application Japan, May 26, 1981, 56-79889
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LM **8 Claims**



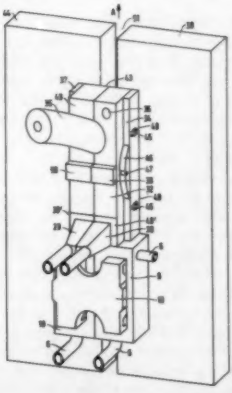
1. A method for fabricating a record stylus for use in detecting signals recorded in a capacitance disk, comprising the steps of:
(a) placing a diamond body in an oxygen containing environment; and
(b) irradiating a predetermined area of the diamond body extending in a direction away from the point where the stylus makes contact with said disk with a beam of heat-producing energy to convert the carbon constituent of the diamond of said area into a conductive layer of carbon.

4,420,676

WELDING APPARATUS

Peter Hirsch, Aachen-Laurensberg; Bernhard Wübbels, Borken, and Iwar Thomson, Aachen, all of Fed. Rep. of Germany, assignors to Friedrich Eichhorn, Aachen, Fed. Rep. of Germany

Filed Apr. 28, 1981, Ser. No. 258,051
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1980, 3016582
Int. Cl.³ H05B *1/00*; B23K *25/00*
U.S. Cl. 219—160 **23 Claims**



1. A welding shoe for a vertical welding machine comprising a holder adapted to be connected to a member of said machine for moving said shoe along the surface of a pair of substantial planar workpieces arranged upright in edge to edge relation narrowly spaced from each other to form a vertical

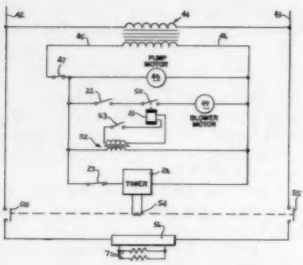
elongate welding gap, first and second sliding segments having surfaces adapted to be in contact with the surfaces of said workpieces, means for separately and independently mounting said sliding segments on said holder in edge to edge relation to define a longitudinal centre groove extending along the mid plane of said welding gap said mid plane being defined as passing through said welding gap perpendicular to the plane of said workpieces, said mounting means comprising a first swivel joint

lying along a horizontal axis perpendicular to the mid plane of the welding gap, and a second swivel joint lying along a vertical axis parallel to the mid plane of the welding gap, each of said joints being set in slotted guides extending perpendicular to the vertical plane of the workpieces to permit movement of said respective segment toward and away from said workpiece while simultaneously permitting said respective segment to swivel independently about each of said joints, and spring means for resiliently biasing said segments away from said holder to maintain the surface of said segment normal in a vertical plane.

4,420,677
HEATING SYSTEM

Everett J. Partington, 620 South Elizabeth, Oconomowoc, Wis. 53066

Continuation of Ser. No. 64,112, Aug. 6, 1979, abandoned. This application Oct. 2, 1981, Ser. No. 308,114
Int. Cl.³ H05B *1/02;* **F24H** *7/00*
U.S. Cl. 219—341 **5 Claims**

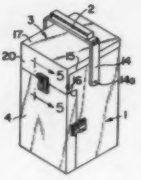


1. A heating system, comprising a closed conduit to contain a liquid, a portion of said conduit constituting a heating chamber, pumping means disposed in the conduit to continuously circulate the liquid through the conduit, a resistance heating unit spaced out of contact with the chamber to heat the liquid in the chamber, heat exchange means disposed in the conduit for transferring heat to air passing over said heat exchange means, proportional timer means operably connected to the heating unit for continuously operating said heating means in cycles of uniform duration, each cycle composed of an "on" interval in which the heating unit is energized and an "off" interval in which the heating unit is deenergized to thereby provide a pulsed heating output, the duration of the "on" and "off" intervals within the cycle each being selectively variable throughout substantially the entire duration of said cycle, temperature sensing means responsive to the temperature of the liquid upstream of the heating chamber and operably connected to said timer means to vary the duration of the "on" interval of said cycle in proportion to the deviation of the liquid temperature from a predetermined set temperature, a duct system connected to a zone to be heated, said heat exchange means disposed within said duct system, a blower disposed in said duct system and disposed to direct air across said heat exchange means and through said duct system, and a thermostat disposed in the zone to be heated and operably connected to said blower, said thermostat means being operable to actuate the blower when the temperature in said zone falls beneath a predetermined value.

4,420,678
LUNCH BUCKET

Frank H. Kalb, 13901 W. Marquette Dr., New Berlin, Wis. 53151

Filed Apr. 3, 1981, Ser. No. 250,136
Int. Cl.³ A21B *1/52;* **F27D** *11/00*
U.S. Cl. 219—387 **7 Claims**

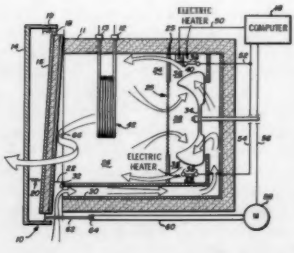


1. A lunch bucket adapted to be carried by an individual workman for on-site use thereby comprising an elongated substantially tubular housing having a substantially greater vertical height than the width and than the depth, said housing having a width substantially the same as the depth to define a cross-section substantially corresponding to a lunch-type sandwich, a handle means secured to the upper end of the housing, said housing having an open top and open front, a top cover secured to said housing at said open top and having a depending side wall projecting down over said open front, a front cover secured to said housing at said open front and extended between said depending side wall and the lower end of said housing, said housing including a plurality of shelf-members defining a plurality of vertically spaced compartments including an uppermost compartment accessible through said open top and through said open side within the length of said depending side wall, and an electrical heating unit including an insulating support and adapted to be releasably deposed within said uppermost compartment.

4,420,679
GAS CHROMATOGRAPHIC OVEN USING SYMMETRICAL FLOW OF PREHEATED - PREMIXED AMBIENT AIR

Robert L. Howe, San Ramon, Calif., assignor to Delta Associates, Inc., San Jose, Calif.

Filed Feb. 26, 1982, Ser. No. 352,656
Int. Cl.³ B01D *15/08;* **H05B** *1/02;* **F27D** *7/04*
U.S. Cl. 219—400 **7 Claims**



1. Apparatus for operating a gas chromatographic oven at near ambient temperature with minimal temperature gradients, comprising in combination:

a housing means with an outer access door and a central chamber consisting of an anterior chamber for providing a heated environment for chromatographic test apparatus and a posterior chamber for minimizing thermal gradients by providing a homogeneous oven temperature about said test apparatus;

insulation means located within the walls of the housing means for providing a thermal boundary between said central chamber and the ambient environment;

plenum chamber means positioned between said central chamber and the housing means for preheating intake air prior to introduction of said air into said central chamber to eliminate temperature differentials in said central chamber;

adjustable inner baffle means positioned between the housing means and said outer access door for regulating the flow of said intake air to the plenum chamber and exhaust air from said anterior chamber;

partition means connected to the inner baffle means for isolating said intake air to the plenum chamber from exhaust air of said anterior chamber;

actuator means located outside the housing means and in mechanical communication with the inner baffle means for positioning the inner baffle means;

air distribution means positioned within said posterior chamber for premixing said intake air with existing central chamber air and distributing said premixed air to said anterior chamber;

heater means positioned within said posterior chamber for heating said premixed air to a program temperature to minimize oven thermal gradients;

sensor means positioned within said posterior chamber of the housing means for sensing the temperature within said central chamber; and

an automatic control means connected to said actuator means and said heater means for receiving temperature data from said sensor means and for transmitting control signals to said heater and actuator means in response to temperature.

4,420,680

HEAT ROLLER TYPE FIXING MEANS

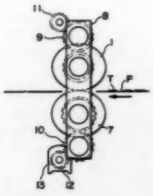
Takashi Itoh, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 3, 1982, Ser. No. 373,845

Claims priority, application Japan, May 18, 1981, 56-73514

Int. Cl.³ H05B *1/00*

U.S. Cl. 219—469 **3 Claims**



1. In a fixing means for an electrostatic recording apparatus and the like which comprise a pair of revolving rollers in pressure contact with one another to define a nip between them, and in which at least one of said rollers is a heating roller, the improvement comprising forming each of said rollers as a deformable thin cylinder, in combination with means elastically supporting each cylinder at its ends, and a pair of aligned pressure rollers extending substantially the full length of said revolving rollers and between them respectively exerting a pressure against said revolving rollers in a direction perpendicular to the axes thereof, whereby said pressure rollers acting upon said elastically supported deformable pressure rollers form between the latter a constant elastically deformable restorable nip across the entire length of said revolving rollers.

4,420,681

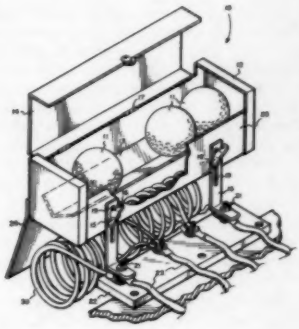
GOLF BALL WARMER

Howard M. Arnold, 3704 Linwood, Royal Oak, Mich. 48073

Filed May 3, 1982, Ser. No. 374,423

Int. Cl.³ H05B *3/06*

U.S. Cl. 219—521 **4 Claims**



1. For attachment to an electric golf cart having fixed electrical resistance elements for speed control of said cart, said resistance elements having sufficient electrical current flowing therethrough to produce sufficient heat during normal operation of said cart to warm golf balls, a golf ball warmer for warming golf balls comprising:

a horizontal elongate container for golf balls having a hinged cover and an opening along the bottom portion of said container, said container formed from a electrically non-conductive material;

electrically insulated mounting means for mounting said container essentially horizontally over said speed control electrical resistance elements of said golf cart; and

a baffle in the form of a V-shaped trough whereby a golf ball is supported by said trough by a two-point contact therewith, said baffle disposed in and attached to said container having a shape adapted to support a plurality of golf balls, said baffle directing heated air from said electrical resistance elements into said container and protecting said golf balls from direct radiant heat from said electrical resistance;

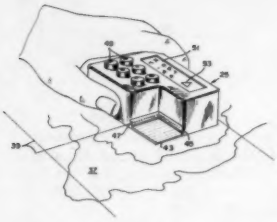
whereby heated air rising from said electrical resistance elements circulates in said container thereby raising the temperature of said golf balls.

4,420,682

INTERACTIVE MAP INFORMATION EXCHANGE SYSTEM

William A. Huber, Sea Girt, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 22, 1982, Ser. No. 360,272
Int. Cl.³ G06K 7/10
U.S. Cl. 235—472 **23 Claims**



1. Apparatus for quickly and accurately exchanging military information between military units, comprising; a map divided into a plurality of map elements or mels, each of said mels being encoded in binary digital form to indicate the x and y coordinates of each said mel, each of said mels being divided into a plurality of sub-mels, means to encode data points to be plotted on said map into binary digital words in which a first group of binary digits of greater significance represent the mel in which the said data point is located and in which the remainder of said binary digits comprises a second group of digits of less significance representing the sub-mel at which said data point is located, one such binary word being provided for each x and y coordinate of each said data point, said apparatus further comprising a manually operated stylus comprising a pair of code sensors adapted to read said first groups of binary digits encoded on said mels, and further apparatus on said stylus to locate the proper sub-mel within the proper mel by utilizing said second group of binary digits.

4,420,683

Patent Not Issued For This Number

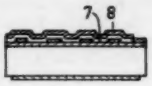
4,420,684

LARGE-SURFACE FAST PHOTODETECTOR SENSITIVE IN THE 0.8–1.1 μM RANGE

Andre Gauthier, Paris, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed Jun. 9, 1981, Ser. No. 271,953
Claims priority, application France, Jun. 13, 1980, 80 13187
Int. Cl.³ H01J 39/12
U.S. Cl. 250—211 J **1 Claim**

1. In a large-surface photovoltaic photodetector, sensitive in the 0.8–1.1 μm range, comprising a substrate made of silicon with resistivity higher than 10^3 Ω.cm, a diffusion layer having a thickness smaller than 1 μm defining a PN junction, a filter placed on the face exposed to the radiations in order to stop the radiations having a wave-length shorter than a predetermined length, and contacts for application of a bias potential, characterized in that the filter is a layer of CdTe integrated in the



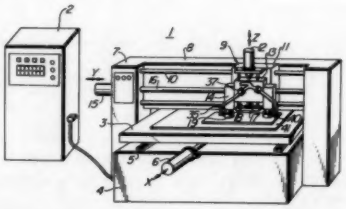
detector and stopping the radiations having a wave-length shorter than 0.8 μm.

4,420,685

METHOD AND EQUIPMENT FOR DETECTING TOOL FAILURE

Tamio Ohtani, Kawasaki, and Yasuhiko Kanaya, Machida, both of Japan, assignors to Hitachi Seiko, Ltd., Tokyo, Japan

Filed Feb. 18, 1981, Ser. No. 235,580
Claims priority, application Japan, Aug. 24, 1979, 54-115795
Int. Cl.³ G01V 9/04
U.S. Cl. 250—222.2 **7 Claims**



6. In a drilling machine, a drilling tool failure detection equipment characterized by the provision of

a drilling tool,

a feed means for moving the drilling tool to or away from a work,

a work holding means which is provided with a through hole through which said drilling tool is extended toward the work when said drilling tool is moved toward the work and which is provided with a guide means communicated with said through hole,

a supporting means for supporting said work holding means in such a way that said work holding means in movable in the direction perpendicular to the axis of said drilling tool,

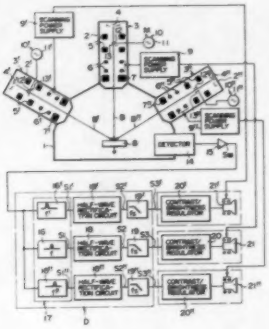
a small chamber or space defined around said drilling tool by said work holding means,

a chip or particle collection means comprising a duct communicated with said small chamber or space and a suction source communicated with said duct for collecting chips or particles resulting from the drilling of the work, and chip or particle detection means for detecting the quantity of collected chips or particles, whereby whether the drilling tool is intact or broken is detected from the quantity of collected and detected chips or particles.

4,420,686
SCANNING ELECTRON MICROSCOPE OR SIMILAR EQUIPMENT CAPABLE OF DISPLAYING SIMULTANEOUSLY A PLURALITY OF IMAGES OF SPECIMEN

Akira Onoguchi, Chofu; Mitsuhisa Miyazawa, Sagamihara; Shigetomo Yamazaki, Hachioji, and Masahiro Inoue, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Akashi Seisakusho, Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 327,163
Claims priority, application Japan, Jan. 29, 1981, 56-11810
Int. Cl.³ G01N *23/00*; G21K *7/00*
U.S. Cl. 250—310 **7 Claims**



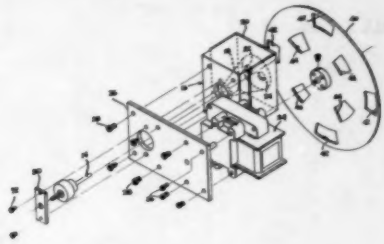
1. A scanning electron microscope or similar equipment capable of irradiating a plurality of beams of charged particles onto a specimen and displaying simultaneously the plurality of images of the specimen, comprising charged particle beam modulation means capable of modulating the intensities of said beams of charged particles through the deflection of said beams by different frequencies, a detector capable of simultaneously detecting signals obtained by irradiating onto the specimen the plurality of beams of charged particles which have been modulated by the charged particle beam modulation means, demodulation selector means capable of demodulating signals from said detector and selecting each specimen image signal from the plurality of pieces of specimen image information obtained by said beams of charged particles, and display means capable of displaying the plurality of images of the specimen upon receipt of signals from said demodulation selector means.

4,420,687
NON-DISPERSIVE INFRARED GAS ANALYZER

Mark S. Martinez, San Gabriel, and Harold W. Pust, Huntington Beach, both of Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Oct. 28, 1982, Ser. No. 437,486
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—343 **8 Claims**

1. A gas analyzer comprising:
radiation generating means for providing a directed beam of radiation;
a generally cylindrical reference cell for containing a reference gas and having first and second ends;
a generally cylindrical measurement cell for containing a sample gas to be analyzed and having first and second ends and an inner diameter substantially equal to the inner diameter of the reference cell;
interrupter means for interrupting the directed beam to provide first and second sequentially pulsed beams, including a disk rotated about its center and having a plurality of circumferentially spaced apart generally arcuate shaped outer apertures for generating the second pulsed beam and a plurality of circumferentially spaced apart generally arcuate shaped inner apertures for generating the first pulsed beam;
first and second baffles each having a first circular aperture substantially equal to the inner diameter of the reference cell and a second circular reducing aperture having a diameter less than the inner diameter of the reference cell;
radiation detection means for measuring the radiation from the two sequentially pulsed beams of radiation; and
means for positioning the radiation generating means, the interrupter means, the first and second baffles, the reference and measurement cells and the radiation detection

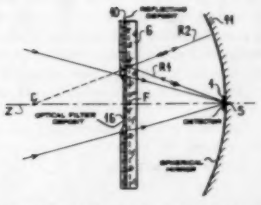


means so that rotation of the disk in cooperation with its inner and outer apertures interrupts the directed beam to produce the first and second sequentially pulsed beams, respectively, which are directed axially through the second and first circular apertures, respectively, of the first baffle, and then through the first ends of the reference and cells respectively, and so that the radiation beams subsequentially emanating from the second ends of the reference and measurement cells are axially directed through the first and second circular apertures, respectively, of the second baffle, and then to the detection means.

4,420,688
DEVICE FOR DETECTING INFRARED RADIATION

Jean-Francois Le Bars, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 21, 1981, Ser. No. 285,566
Claims priority, application France, Jul. 22, 1980, 80 16126
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—352 **15 Claims**



1. A device for detection of infrared radiation comprising:
a detector having at least one photo detector element for detecting the infrared radiation which arrives at the detector along a receiving optical path;
a cooling device within which the detector is supported by a metallic cold table and downstream of a transparent window which insures fluid-tightness while allowing the received radiation to pass to the detector; and
reflecting means whereby the angle of view of the detector is limited and the radiation emitted by the detector externally of the desired angle of view is reflected back to said detector, said means being constituted by a mirror formed by a reflecting deposit on one face of a transparent element interposed on the optical path of reception of said

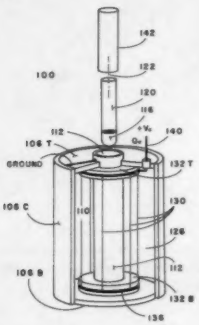
infrared radiation, said reflecting deposit preventing by reflection the reception of radiation located externally of the angle of view, and being formed externally of the cooling device and at least at the level of the outer face of the window.

4,420,689

MULTI-ANODE DEEP WELL RADIATION DETECTOR

Arthur H. Rogers, Los Altos, Calif.; Kevin J. Sullivan, Medfield, Mass., and Gerald R. Mansfield, Painted Post, N.Y., assignors to Medical and Scientific Designs Inc., Rockland, Mass.

Filed Dec. 22, 1981, Ser. No. 333,629
Int. Cl.[3] G01T *1/18*
U.S. Cl. 250—385 37 Claims



1. An apparatus for assaying a radioactive sample within an assay region for individual gamma radiations emitted therefrom, by providing an output charge in response to each detected gamma radiation propagating from the radioactive source in the assay region, comprising:

a plurality of spaced fine anode wires;

area cathode means encompassing the assay region containing the radioactive sample, and spaced from the anode wires defining a collection region between the cathode means and the anode wires through which the gamma radiations propagate;

conversion medium within the collection region for individually converting the energy of at least a portion of the gamma radiations into transient charged particles;

power source for maintaining an electric field across the collection region from the anode wires to the area cathode means, which electric field accelerates the transient positive charge towards the area cathode, and accelerates the transient negative particles towards the anode wires causing avalanche multiplication and collection of the negative particles onto the anode wires for defining the output charge; and

a barrier means between the assay region and the collection region for physically isolating the conversion medium from the radioactive sample.

4,420,690

SPECTROMETRIC MICROSAMPLING GAS CELLS

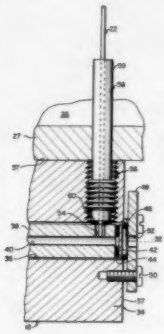
Donald Kuehl, Winchester, Mass., assignor to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Mar. 5, 1982, Ser. No. 354,933
Int. Cl.[3] G01N *21/00, 23/10*
U.S. Cl. 250—428 7 Claims

1. A sample cell for absorption spectrometry of small volume samples in a continuously flowing carrier gas stream, said sample cell comprising in combination:

a holder in the form of a body of thermally conductive material, said body having an elongate bore penetrating therethrough substantially normal to and between a first and a second face of said body, said body further being provided with a pair of secondary bores extending radially from said elongate bore and communicating therewith and with the exterior of said body, a one each of said secondary bores being located adjacent a respective one of said first and second faces;

an elongate open-ended hollow tube dimensioned to fit said elongate bore and to extend therein substantially from said first face to said second face, said tube being further provided with a pair of radial openings communicating between the interior and the exterior of said tube and disposed substantially in axial alignment with said secondary bores;



a pair of fluid conductive transfer line means, each of said transfer line means being disposed in fluid communication with the interior of said tube and the exterior of said body through a respective combined radial opening and secondary bore;

means sealing and transferline means to said tube; and

a pair of window means, each of said window means being secured to a respective one of said first and second faces and abutting and sealing a respective open end of said hollow tube.

4,420,691

METHOD OF ALIGNING ELECTRON BEAM APPARATUS

John J. Zasio, Sunnyvale, Calif., assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1978, Ser. No. 973,909
Int. Cl.[3] G01M *21/00*; A61K *27/02*
U.S. Cl. 250—491.1 6 Claims

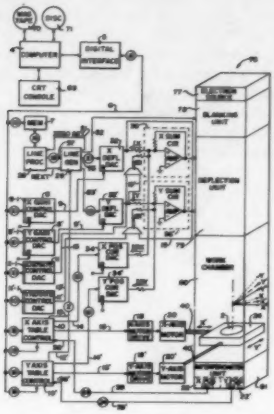
1. In an electron beam exposure apparatus including an electron source, beam deflection means, a work chamber, an X-Y table within said work chamber, and a work piece holder including alignment device mounted on said table, a method of aligning said electron beam and exposing a work piece to said electron beam comprising the steps of

(a) moving said table and said work piece to focus said electron beam on a fixed alignment mark on said work piece,

(b) aligning said electron beam to said fixed alignment mark on said work piece by adjusting gain and rotation of said electron beam to conform to the coordinates of said work piece,

(c) determining the coordinates of said table relative to the coordinates of said work piece mounted in said holder on

said table by noting the coordinates of at least two known positions on said work piece on the axes of said table, and



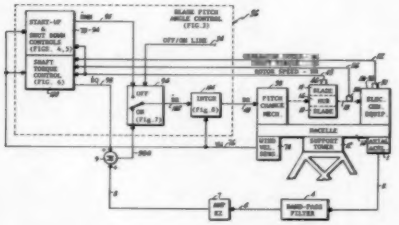
(d) moving said table whereby a plurality of partitions of said work piece are exposed to said electron beam.

4,420,692

MOTION RESPONSIVE WIND TURBINE TOWER DAMPING

Joseph M. Kos, Holyoke, Mass.; John P. Patrick, South Windsor, and Kermit I. Harner, Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 2, 1982, Ser. No. 364,706
Int. Cl.³ F03D *9/00, 7/04*
U.S. Cl. 290—44 **4 Claims**



1. A wind turbine system for generating electric power, comprising:

a tower;

a rotor disposed on said tower including blades disposed for rotation about an axis and a blade pitch angle change mechanism;

means for providing an actual torque/power signal indicative of actual torque/power generated by said wind turbine system; and

signal processing means for providing a reference torque/power signal indicative of desired generated torque/power, and for providing to said blade pitch angle change mechanism a blade pitch angle reference signal as a function of the difference between said actual torque/power signal and said reference torque/power signal;

characterized by:

motion responsive means disposed on said tower in the vicinity of said rotor for providing a motion signal indicative of motion of said tower parallel with said blade rotation axis; and

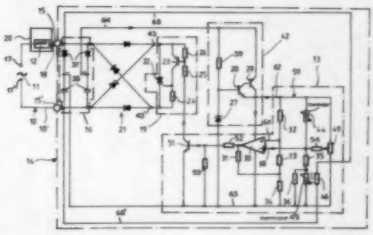
said signal processing means comprising means for providing said blade pitch angle reference signal as a function of both said motion signal and the difference between said actual torque/power signal and said reference torque/power signal.

4,420,693

LOAD-CONTROL SYSTEM WITH TWO-CONDUCTOR SUPPLY CIRCUIT

Henning Becker, and Fritz Jauss, both of Schönaich, Fed. Rep. of Germany, assignors to Centra-Bürkle GmbH & Co., Schönaich, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,434
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3042947
Int. Cl.³ F23N *5/20;* **G05D** *23/00*
U.S. Cl. 307—66 **19 Claims**



1. A load-control system responsive to variations in an external parameter, comprising:

a diode bridge connected across a variable-impedance control element;

a loop circuit including a pair of conductors with input ends connected across a power supply in the form of an alternating-current source and with output ends connected across said diode bridge;

a load inserted in one of said conductors between said input and output ends;

sensing means coupled to said control element for switching same between a low-impedance state and a high-impedance state, respectively corresponding to a high and a low load current, in response to predetermined changes in said external parameter; and

feed means including a voltage-doubling rectifier bridge connected across said output ends between said load and said diode bridge for keeping said sensing means operational even in said low-impedance state of said control element, said rectifier bridge having a first pair of adjoining arms with two relatively inverted diodes connected to one of said output ends and having a second pair of adjoining arms with two capacitors connected to the other of said output ends, said feed means further including two direct-current supply leads connected to respective junctions of said first pair of arms with said second pair of arms.

4,420,694

MUTING CIRCUIT

Teppei Yokota, Funabashi, and Yoshiro Joichi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 22, 1981, Ser. No. 285,839
Claims priority, application Japan, Jul. 28, 1980, 55-103321
Int. Cl.³ H01H *7/16*
U.S. Cl. 307—130 **2 Claims**

1. A digital muting circuit comprising, an input terminal for receiving a PCM signal having words of plural bits, an output

terminal for deriving said PCM signal, a controlling circuit for generating a muting signal, a detecting circuit for examining the bit pattern of said PCM signal to produce a detected signal when the signal level of the waveform corresponding to said

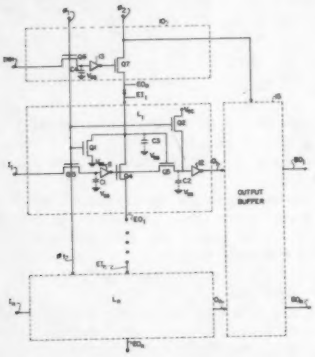
PCM signal is less than a predetermined value, and switching means connected between said input terminal and said output terminal and for replacing said PCM signal with a PCM signal having a bit pattern representing the zero level by receiving said detected signal while said muting signal is generated.

4,420,695

SYNCHRONOUS PRIORITY CIRCUIT

Amnon Fisher, Ramat Hasharon, Israel, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 26, 1981, Ser. No. 267,381
Int. Cl.³ H03K *17/693, 17/26, 5/153, 5/22*
U.S. Cl. 307—242 **2 Claims**



2. A synchronous priority circuit, comprising "n" input terminals having a descending order of priority 1 . . . , k, . . . n, wherein "k" and "n" are positive integers greater than 1;

"n" output terminals corresponding to the "n" input terminals; and

a logic circuit connected to the "n" input terminals and the "n" output terminals for causing a logical "true" signal to be provided from any given output terminal in response to a logical "true" signal being provided at its corresponding input terminal when a logical "true" signal is not provided at any higher priority input terminal, wherein the logic circuit comprises

"n" logic elements, each of which is connected between one of the input terminals and its corresponding output terminal and each of which has an enable input and an enable output, wherein the logic elements are interconnected, with the enable input of the "kth" logic element being connected to the enable output of the "k−1)th" logic element;

wherein each logic element provides a logical "true" signal to the output terminal connected thereto only in response to both a logical "true" signal at the corresponding input terminal and an enable signal at its enable input, and further provides an enable signal at its enable output only if a "true" signal is provided to its enable input, and it does not provide a logical "true" signal to the output terminal connected to the logic element;

means for providing an enable signal to the enable input of the first logic element;

means for inhibiting the provision of an enable signal to the enable input of the first logic element; and

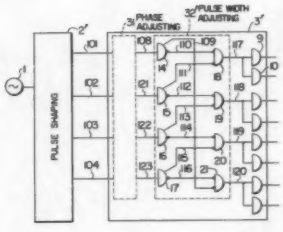
a current path between the enable input and the enable output in each logic element wherein the current path includes a field effect transistor connected in series between the enable input and the enable output, with its gate being coupled to the corresponding input terminal for preventing an enabling signal from being provided from the enable output when a logical "true" signal is provided at the corresponding input terminal.

4,420,696

PULSE TRAIN PRODUCING APPARATUS

Kazutoshi Gemma, Sagamihara, and Noriaki Hashimoto, Hadano, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1981, Ser. No. 238,039
Claims priority, application Japan, Feb. 25, 1980, 55/22600
Int. Cl.³ H03K *5/15, 19/21*
U.S. Cl. 307—262 **14 Claims**



1. A pulse train producing apparatus comprising first means for generating a plurality of pulse trains different in phase from one another, the pulses in one train generated from said first means overlapping at respective trailing edge portions including the trailing edges thereof, respectively, with leading edge portions including the leading edges of the pulses in a different train, and second means receiving said pulse trains generated from said first means to cut away the overlapping trailing or leading edge portions of the respective pulses in each of said pulse trains, said second means including a binary output circuit provided for each of the pulse trains to generate a non-inverted output and an inverted output in response to each of the pulses thereof, and an AND circuit connected to said binary output circuit for making an AND operation on the non-inverted output appearing from said binary output circuit and the inverted output appearing from the binary output circuit provided for a different one of said pulse trains.

4,420,697
PROCESS AND APPARATUS FOR MONITORING THREAD BREAKAGE BY THE USE OF A THRESHOLD DEVICE

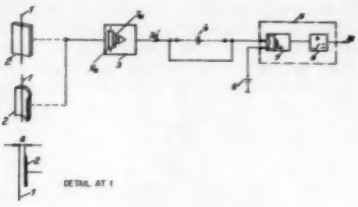
Gerhard Fiedler, Greiz; Werner Fritzsche, Greiz-Moschwitz; Frank Herold, and Uwe Tolkmitt, both of Greiz, all of German Democratic Rep., assignors to VEB Kombinat Wolle und Seide, Meerane, German Democratic Rep.

Filed Apr. 7, 1981, Ser. No. 251,811

Claims priority, application German Democratic Rep., Apr. 29, 1980, 220763; Oct. 9, 1980, 224417; Nov. 21, 1980, 225376

Int. Cl.³ D01H *13/16;* **G01R** *29/12;* **D04B** *35/14*

U.S. Cl. 307—308 **11 Claims**



1. An apparatus for monitoring breakage of a moving thread, comprising a flat or concave plane electrode positioned in the proximity of but not touching the thread so that an electrical charge corresponding to the stochastic charge on the thread is electrostatically induced on said electrode, and an amplifier having a high input impedance connected to said electrode so that a potential signal corresponding to the stochastic charge is provided at the output of said amplifier, so long as the thread has not broken.

4,420,698
PEAK DETECTOR

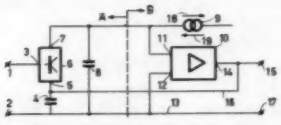
Johannes F. A. Raadsen, Enschede, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 20, 1981, Ser. No. 236,358

Claims priority, application Netherlands, Feb. 29, 1980, 8001234

Int. Cl.³ H03K *5/153;* **G01R** *19/04*

U.S. Cl. 307—351 **9 Claims**



1. A peak detector comprising, first and second input terminals for receiving an input voltage having a peak value, a voltage comparator circuit comprising a transistor having base, emitter and collector electrodes, means connecting said first input terminal to one of said emitter and base electrodes, a first capacitor operative as a storage element and connected to the other one of said emitter and base electrodes, a current source arrangement, a charging circuit coupled to said first capacitor and comprising an amplifier arrangement having a high-ohmic input connected to the collector electrode of said transistor and to said current source arrangement, a second capacitor connected to said collector electrode of the transistor, means coupling said first and second capacitors to the second input terminal and to a point of reference potential, said voltage comparator circuit being operative to compare said input voltage with the voltage across the first capacitor so as to control the charge on said first capacitor in a compensating sense if the capacitor voltage is not directly proportional to the input voltage peak value to be measured, and second means connecting an output of said amplifier arrangement to an output terminal of the peak detector and to said other one of said emitter and base electrodes.

4,420,699
FREQUENCY TO VOLTAGE CONVERTER FOR A DIGITAL TACHOMETER

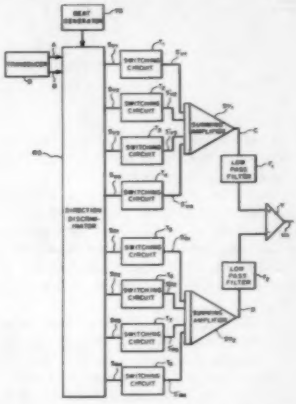
Walter Schmitt, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Mar. 30, 1982, Ser. No. 363,475

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115497

Int. Cl.³ H03K *5/26, 9/04*

U.S. Cl. 307—519 **9 Claims**



1. A frequency-to-voltage converter for use with an incremental measuring system of the type which generates at least two periodic measured signals, said converter comprising:

direction discriminator means, responsive to the measured signals, for generating at least two forward pulse trains and at least two backward pulse trains in response to the phase relationship between the measured signals, the at least two forward pulse trains each having a frequency corresponding to and no less than that of the measured signals and phase shifted with respect to one another, the at least two backward pulse trains each having a frequency corresponding to and no less than that of the measured signals and phase shifted with respect to one another;

at least two first switching means, each coupled to the discriminator means to receive a respective one of the forward pulse trains, for generating a sequence of constant energy pulses in response to the respective pulse train;

at least two second switching means, each coupled to the discriminator means to receive a respective one of the backward pulse trains, for generating a sequence of constant energy pulses in respose to the respective pulse train;

means for combining the sequences of constant energy pulses from the first switching means to generate a first composite signal;

means for combining the sequences of constant energy pulses from the second switching means to generate a second composite signal;

a differential amplifier having two input terminals and an output terminal;

means for passing low frequency components of the first composite signal to the first input terminal; and

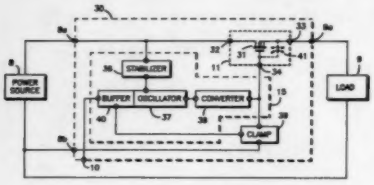
means for passing low frequency components of the second composite signal to the second input terminal.

4,420,700

SEMICONDUCTOR CURRENT REGULATOR AND SWITCH

Gary V. Fay, and Alvin Pshaenich, both of Scottsdale, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed May 26, 1981, Ser. No. 267,227
Int. Cl.³ H03K *17/00*; G05F *1/56*
U.S. Cl. 307—571 **9 Claims**



1. An apparatus responsive to an external signal for regulating the flow of current from a power source of predetermined voltage to a load, comprising:

enhancement mode type current conducting means for regulating current flow between a first power terminal adapted to be coupled to said power source and a second power terminal adapted to be coupled to said load, and having a control means for enabling said current flow only in response to a control voltage larger than said predetermined voltage;

clamp means responsive to said external signal and coupled to said control means for disabling said current flow only in response to a turn-off portion of said external signal;

driver means coupled to said power source and said control means for generating said control voltage from said predetermined voltage in response only to a turn-on portion of said external signal, wherein said driver means comprise;

stabilizer means coupled to said first power terminal and having a limited voltage output;

oscillator means responsive to said external signal, coupled to said stabilizer voltage output and having an output for oscillatory signals; and

converter means coupled to said output for oscillatory signals and to said control means for converting said oscillatory signals to unidirectional pulses for accumulation in storage capacitance to produce said control voltage on said control means.

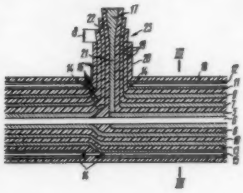
4,420,701

COUPLING UNIT FOR CONNECTION OF GENERATOR HIGH-VOLTAGE WINDING AND INLET BAR

Pavel Z. Nikitin, Moscow; Yanush Danilevich, Lenigrad; Konstantin N. Maslennikov, Novosibirsk; Pavel S. Kabanov, Moscow; Konstantin F. Potekhin, Novosibirsk; Lev A. Zolotov, Moscow; Anatoly A. Karymov, Leningrad; Alexandr I. Nikolsky, Moscow; Tibor M. Nemeni, Moscow; Gennady A. Bezchastnov, Moscow, and Jury E. Morin, Moscow, all of U.S.S.R., assignors to Nauchno-Issledovatelsky Sektor Vsesojuznogo Proektno-Izyskatelskogo I Nauchno-Issledovatelskogo Instituta "Gidroproekt" Imeni S.Ya. Zhuka, Moscow, U.S.S.R.

PCT No. PCT/SU80/00220, § 371 Date Aug. 26, 1982, § 102(e) Date Aug. 26, 1982, PCT Pub. No. WO82/02460, PCT Pub. Date Jul. 22, 1982
PCT Filed Dec. 30, 1980, Ser. No. 414,371
Int. Cl.³ H02K *3/24*
U.S. Cl. 310—54 **1 Claim**

1. A coupling unit for connection of a generator high-voltage winding and an inlet bar, comprising insulated conductors of the generator high-voltage winding, located in the front part of the generator stator and joined to the inlet bar in the zone of a high-voltage lead-in and cooling ducts characterized in that conducting layers (1,2,3,4) made up of insulated conductors form summary turns of the generator high-voltage winding in the shape of concentrically arranged tubes (5,7,9,11,12) connected to one another in the high-voltage lead-in zone by template tubular elements (16) securing consequtive transition of the tube (5) of the first summary turn of the high-voltage winding into the tube (7) of the second summary turn, of the tube (7) of the secondary summary turn into a tube (9) of the third summary turn and so on until the tube (9) of the penultimate summary turn changes over into the tube (11 and 12) of the last summary turn of the high-voltage generator winding, which is the zero potential lead-out, the cooling ducts being separated into a central cooling duct (6) which, in this case, is the internal central space of the tube of the first summary turn of the generator high-voltage winding and peripheral cooling ducts (15), each such duct being formed by two adjoining tubes



(11 and 12) which are electrically connected by jumpers (14) and produce one summary turn of the generator high-voltage winding, whereas the inlet bar (17) having the maximum potential and a coating composed of insulation layers (8,10,13) separated by sheaths (19), each sheath (19) being connected to its turn of the generator high-voltage winding, is made of a cylinder (21) and a truncated cone (22), wherein one base of the cylinder (21) is connected to the beginning of the first summary turn of the generator high-voltage winding and the other base of said cylinder (21) is connected to the beginning of the first summary turn of the generator high-voltage winding and the other base of said cylinder (21) is the smaller base of the truncated cone (22), the insulation layer (8) with its sheath (19), which is adjacent to the inlet bar (17) is equal in height thereto, whereas each sunsequent insulation layer (10,13) with its sheath (10) is arranged below the preceding insulation layer by the same value δ, the inlet bar (17) and all adjacent insulation layers (8,10,13,18) with their sheaths (19,20) constituting a high-voltage inlet element (23).

4,420,702

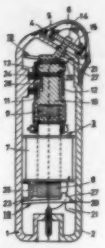
RESILIENT MOTOR MOUNTING FOR AN ELECTRIC DRY SHAVER OR THE LIKE

Ingomar Mixner, Klagenfurt, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 202,034, Oct. 29, 1980, abandoned.
This application Jul. 12, 1982, Ser. No. 397,390
Claims priority, application Austria, Nov. 22, 1979, 7441/79
Int. Cl.³ H02K *5/04*
U.S. Cl. 310—50 **2 Claims**

1. An apparatus such as a dry shaver, which comprises a housing assembly forced by two opposing housing shells; an electric motor within the housing assembly; at least one support member formed integrally with and extending inwardly from only one housing shell; an elastic pad associated with the inwardly projecting end of said support member; a resilient hook member adjacent said one support member, said resilient hook member being formed integrally with said one housing shell and projecting inwardly from only said one housing shell; a hook portion at the free end of said resilient hook member, said hook portion engaging an edge portion of the motor and urging said motor against the elastic pad and its associated

support member to hold the motor only against said one housing shell; and a projection extending inwardly from only the other housing shell, said projection engaging the free end of



the resilient hook member and constituting a stop for the same to thereby position the resilient hook member relative to the motor.

4,420,703

PERMANENT MAGNET MOTOR DRIVEN WINDOW LIFTER

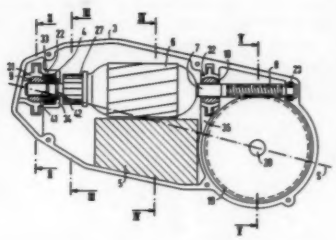
Peter Adam, Höchberg; Werner Seuffert, Bergrheinfeld, and Abdul R. Saeed, Würzburg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 144,572, Apr. 28, 1980, which is a continuation of Ser. No. 964,634, Nov. 11, 1978. This application Jul. 23, 1982, Ser. No. 400,989

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1977, 2556531

Int. Cl.³ H02K *21/26*

U.S. Cl. 310—154 **8 Claims**



1. A motor drive useful in a window lifter for motor vehicles, having an integrated narrow housing comprising:

(a) a substantially continuous hollow, non-magnetic frame;

(b) a permanent magnet DC motor comprising

(1) a rotor;

(2) a single permanent magnet; and

(3) first and second pole plates for conducting flux from said magnet to opposite sides of said rotor, said pole plates in contact with said magnet on opposite sides thereof;

(c) a worm gear drive comprising:

(1) a drive shaft extending from said rotor and connected to a worm;

(2) a worm gear which lies in the plane of the drive shaft engaging said worm;

(d) said single permanent magnet located adjacent to the rotor on the same side of the shaft as the worm gear and bounded on one side by said rotor on an adjacent side by said worm gear and on the side opposite said rotor by said hollow non-magnetic frame; and

(e) said pole plates being in the form of covers fastened to said frame on opposite sides of the rotor, magnet and worm gear, said covers and said continuous hollow non-magnetic frame thereby forming the housing for said motor drive.

4,420,704

SMALL ELECTRIC MOTOR

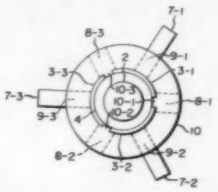
Takaichi Mabuchi, Matsudo, Japan, assignor to Mabuchi Motor Co., Ltd., Japan

Filed Oct. 13, 1981, Ser. No. 310,629

Claims priority, application Japan, Oct. 23, 1980, 55-151495[U]

Int. Cl.³ H02K *13/06*

U.S. Cl. 310—220 **6 Claims**



1. A commutator portion of a small electric motor, comprising:

a rotatable motor rotor shaft;

an insulating cylinder fixed to said shaft having an enlarged diameter portion, said enlarged diameter portion having a plurality of spaced guide grooves therein;

a plurality of commutator segments circumferentially spaced on a portion of said insulating cylinder, each commutator segment having a commutator terminal extending through a respective one of said guide grooves and a gap defined between adjacent commutator segments;

said enlarged diameter portion of said insulating cylinder having a reservoir defined therein for accommodating each gap;

an electrically conductive adhesive disposed in each reservoir and deposited in such a manner as to bridge each gap, said electrically conductive adhesive being a mixture prepared by mixing both or one of metallic powder and carbon powder with an adhesive which hardens; and

means connected to said enlarged diameter portion for separating each reservoir from portions of said commutator segments adapted to be contacted by brushes of the small electric motor.

4,420,705

CONTACT AND TERMINAL ASSEMBLY FOR A BRUSH WEAR INDICATOR

Dan W. Kimberlin, Erie, Pa., assignor to General Electric Company, Research Triangle Park, N.C.

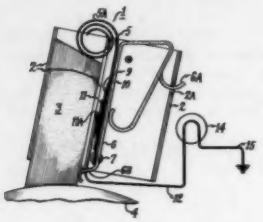
Filed May 26, 1982, Ser. No. 382,034

Int. Cl.³ H02K *13/00*

U.S. Cl. 310—242 **8 Claims**

1. A brush wear indicator contact and terminal assembly, for use with a self-winding brush-follower spring having a coil portion that operates as a contactor to complete an electrical circuit with the assembly thereby to actuate a signal responsive to the occurrence of a predetermined degree of brush wear, comprising, a sheet of flexible dielectric material fastened to said spring adjacent the uncoiled end thereof, a generally flat, bendable contact plate having a ridge on a first surface thereof and having a groove on a second surface thereof, said groove being adapted to receive an electrical conductor therein, an electrical conductor having a predetermined part thereof mounted in said groove and in electrical conducting relationship to the contact plate, said contact plate being mounted in fixed relation to said sheet of dielectric material and to the uncoiled end of said spring, with the groove in the plate facing

said sheet to position the ridge on the contact plate in the path of movement of the coil portion of the spring so that the ridge is engaged by the coil responsive to the spring winding up and moving the coil a predetermined distance toward the fixed end



of the spring, thereby to electrically connect the spring to said electrical conductor, said sheet of dielectric material being effective to electrically isolate the contact plate from the spring responsive to said coil being disengaged from said ridge.

4,420,706

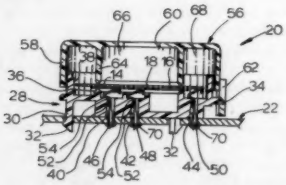
CONNECTOR ASSEMBLY FOR A PIEZOELECTRIC TRANSDUCER

Donald J. Siebold, Naperville; Michael K. Troy, Westmont, and William R. Lenz, Crestwood, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Continuation of Ser. No. 138,088, Apr. 7, 1980, abandoned, which is a continuation of Ser. No. 3,477, Jan. 15, 1979, abandoned. This application Dec. 28, 1981, Ser. No. 335,071

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—324 **17 Claims**



1. A connector assembly for supporting a piezoelectric transducer disc in a position generally parallel to and spaced above a surface of a printed circuit board, said connector assembly comprising:

a unitary formed conductive body having

a base structure;

first tab means extending downwardly from said base structure for connection to the printed circuit board and for positioning said base structure adjacent said printed circuit board surface;

a plurality of disc holding means extending upwardly from said base structure engageable with the periphery of the disc at spaced locations around the disc periphery for releasably supporting the disc above the base means and for electrically contacting the disc periphery;

a contact supporting portion;

additional tab means extending downwardly from said contact supporting portion for connection to the printed circuit board and for positioning said contact supporting portion adjacent said printed circuit board surface;

a resilient contact extending upwardly from said contact supporting portion and adapted to electrically and resiliently engage said disc at a region spaced inwardly from the disc periphery; and

a frangible portion interconnecting said base structure and said contact supporting portion, said frangible portion being separable from said conductive body for electrically isolating said contact supporting portion from said base structure.

4,420,707

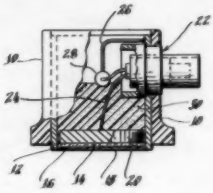
BACKING FOR ULTRASONIC TRANSDUCER CRYSTAL

Howard E. VanValkenburg, New Fairfield, Conn., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Aug. 9, 1982, Ser. No. 406,122

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—327 **4 Claims**



1. An electroacoustic transducer for ultrasonic inspection systems and the like which comprises:

a piezoelectric element having front and back faces; and

a rigid plate in intimate contact with the back face of the crystal having high ultrasonic energy attenuation characteristics, said plate being formed substantially solely of porous sintered metal.

4,420,708

HIGH-PRESSURE SODIUM VAPOR DISCHARGE LAMP

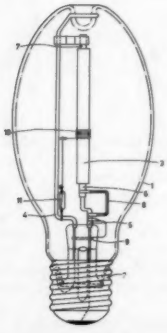
Cornelis A. J. Jacobs, and Peter A. W. Tielemans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 960,419, Nov. 13, 1978, abandoned. This application Aug. 28, 1980, Ser. No. 182,192

Claims priority, application Netherlands, Dec. 2, 1977, 7713348

Int. Cl.³ H01J *61/073*

U.S. Cl. 313—628 **2 Claims**



1. A high-pressure sodium vapor discharge lamp which comprises: a hermetically sealed tubular ceramic discharge vessel containing sodium, mercury and a rare gas, at least first and second lead-through conductors extending through said discharge vessel, at least first and second electrodes disposed in said discharge vessel which are respectively connected to said first and second lead-through conductors, said electrodes extending into said vessel and having a plurality turns of tungsten wire disposed around the end thereof extending into said ves-

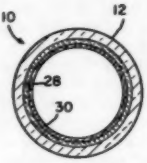
sel, the space intermediate said turns being filled with an electron-emitting material substantially consisting of alkaline earth metals bound to oxygen and tungsten bound to oxygen, said electron-emitting material comprising barium, strontium and calcium as alkaline earth metals bound to oxygen and that the molar ratio of the total quantity of said alkaline earth metals bound to oxygen to the tungsten bound to oxygen is between 8 and 50.

4,420,709

FLUORESCENT LAMP EMPLOYING MEANS FOR CONTROLLING EMISSION OF SHORT WAVELENGTH ULTRAVIOLET RADIATION

Kendrick D. Rattray, Danvers, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 9, 1981, Ser. No. 319,339
Int. Cl.³ H01J 1/62
U.S. Cl. 313—486 2 Claims



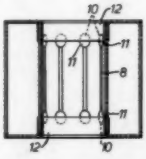
1. A fluorescent lamp useful in the biomedical treatment of skin disorders, said lamp comprising means for generating a relatively broad spectrum of ultra violet radiation including desirable long wavelength radiation and less desirable short wavelength radiation, the improvement comprising: a layer of a first phosphor within said lamp, said first phosphor being adhered to the interior surface of said lamp and absorbing said short wavelength radiation and re-emitting this absorbed energy as said long wavelength radiation; said means for generating said relatively broad spectrum of ultraviolet radiation including a low pressure mercury arc discharge and a second layer of phosphor overlying said first phosphor.

4,420,710

CO-AXIAL MAGNETRONS

Alan H. Pickering, Chelmsford, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Filed Aug. 14, 1981, Ser. No. 292,749
Claims priority, application United Kingdom, Aug. 14, 1980, 8026569
Int. Cl.³ H01J 25/50
U.S. Cl. 315—39.77 9 Claims



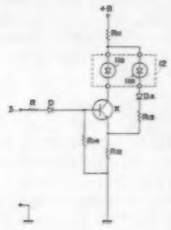
1. A co-axial magnetron comprising:
an outer cylinder having a longitudinal axis;
an anode member coaxial with said longitudinal axis and surrounded by said outer cylinder, the space between said anode member and said outer cylinder forming a main resonant cavity;
partition means connected to said anode member for forming a plurality of subsidiary cavities within the space defined by said anode member, said anode member having a plurality of slots extending through the wall thereof in the direction of said longitudinal axis for coupling said main resonant cavity to at least one of said subsidiary cavities, each of said slots having an elongated central portion and opposite ends; and
a resistive attenuating material located within at least one of said slots at at least one end thereof to attenuate undesired slot modes of oscillation.

4,420,711

CIRCUIT ARRANGEMENT FOR DIFFERENT COLOR LIGHT EMISSION

Soichi Takahashi, Tokyo, and Susumu Kobayashi, Ebina, both of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jun. 11, 1982, Ser. No. 387,432
Claims priority, application Japan, Jun. 15, 1981, 56-87718[U]
Int. Cl.³ H05B 37/02
U.S. Cl. 315—296 6 Claims



1. A circuit arrangement for different color light emission, comprising:
(a) first series circuit of a first light-mitting element having a given color, a diode and a resistor; and
(b) a second series circuit of a second light-emitting element having another color, and an active element, said active element being responsive to an input control signal so as to change a current flowing therethrough, said first and second series circuits being connected in paralle! and interposed between two terminals of a power source, the impedance of said first series circuit being selected to be much greater than that of said second series circuit when said active element is conductive.

4,420,712

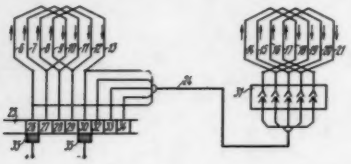
ELECTRIC DRIVE FOR SYNCHRONOUS DISPLACEMENT OF MECHANICALLY INDEPENDENT MACHINE ASSEMBLIES MOVING ALONG EQUIDISTANT TRAJECTORIES

Viktor T. Belikov; Anatoly D. Ivlev; Valentin M. Sitnichenko; Vladimir I. Shvets, and Leonid V. Bushtian, all of Odessa, U.S.S.R., assignors to Odessky Ordena Trudovogo Kraskogo, Odessa, U.S.S.R.

PCT No. PCT/SU81/00032, § 371 Date Dec. 7, 1981, § 102(e) Date Dec. 7, 1981, PCT Pub. No. WO81/03092, PCT Pub. Date Oct. 29, 1981
PCT Filed Apr. 10, 1981, Ser. No. 329,280
Claims priority, application U.S.S.R., Apr. 19, 1980, 2912668
Int. Cl.³ H02K 41/03
U.S. Cl. 318—41 3 Claims

1. An electric drive for synchronous displacement of mechanically independent machine assemblies moving along equidistant trajectories, comprising at least two d.c. electric motors electrically connected to one another, each including a stationary former of magnetic field, a movable portion located within the zone of action of this magnetic field, an excitation

winding and conductors of sections of an armature winding, and a commutating device connected to the armature winding sections, characterized in that each former of magnetic field is a ferromagnetic strip provided with pole-forming projections disposed in two rows along the displacement direction, the pole-forming projections of one row being shifted relative to the pole-forming projections of another row, the movable portion of each motor is a ferromagnetic module carrying the



excitation winding and conductors of the armature winding, the conductors of the armature winding accomplish electrical connection between the motors, and the ends of sections thereof, terminated at the side of one of the motors, are connected to the commutating device for forced commutation of these sections as a function of a relative location of the ferromagnetic modules and the pole-forming projections of corresponding formers of magnetic field.

4,420,713

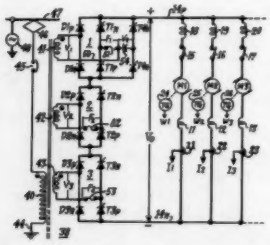
TURN-OFF CONTROL MEANS FOR AN AC-TO-DC ELECTRIC POWER CONVERTER

Prem G. N. Chandran, and Edward S. Matulevich, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Sep. 30, 1982, Ser. No. 429,727

Int. Cl.³ H02P 5/12; H02M 7/155

U.S. Cl. 318—71 **15 Claims**



1. Improved means for controlling an electric power converter used to supply direct current to at least one electric motor, said converter comprising the combination of

a plurality of rectifying circuits each having a-c input terminals, a pair of d-c output terminals, and controllable means including at least one pair of alternately conducting main electric valves for interconnecting said input and output terminals so as to convert alternating voltage at said input terminals to direct voltage of variable average magnitude at said output terminals, the pair of main valves in a first one of said rectifying circuits having cyclically operative valve turn off means respectively associated therewith,

means for respectively applying a plurality of in-phase alternating voltages from an a-c power source to corresponding input terminals of said rectifying circuits,

means for serially connecting the output terminal pairs of said rectifying circuits to an electric load circuit including said motor, whereby the voltage applied to said load circuit is the sum of the output voltages of all of said rectifying circuits,

means for providing speed and current feedback signals respectively representative of the speed of said motor and of the magnitude of current that said converter supplies thereto,

means responsive to said feedback signals and to a given command signal for producing a control signal having a value that varies between predetermined first and second limits as a function of any error between actual and desired magnitudes of motor current, and

turn on control means responsive to said control signal for generating a first set of firing signals capable of periodically turning on said main valves in said first rectifying circuit in synchronism with the alternating voltage applied to the input terminals thereof and for generating a second set of firing signals capable of periodically turning on the main valves in a second one of said rectifying circuits in synchronism with the alternating voltage applied to the input terminals thereof, the firing signals of said first set being nominally generated at an ignition angle (α_1) that varies from fully retarded to fully advanced as said control signal varies over a first predetermined range of values extending from said first limit to a preselected intermediate value of said control signal and the firing signals of said second set being nominally generated at an ignition angle (α_2) that varies from fully retarded to fully advanced as said control signal varies over a second predetermined range of values extending from approximately said preselected intermediate value to another control signal value outside of said first range,

wherein the improvement comprises turn off control means responsive to said speed feedback signal and operative to control said valve turn off means so that normally said main valves in said first rectifying circuit are periodically turned off in synchronism with the alternating voltage applied to the input terminals thereof at a desired extinction angle (β) which varies as a function of motor speed.

4,420,714

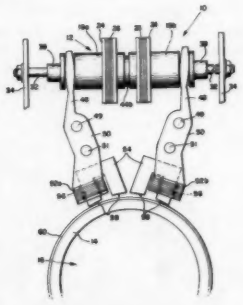
APPARATUS FOR CONTINUOUSLY INCREMENTING AN OUTPUT MEMBER

Christian C. Petersen, Westwood, and Bernard C. Westgate, Jr., Bradford, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 2, 1981, Ser. No. 308,151

Int. Cl.³ H02K 33/16; G03B 9/10

U.S. Cl. 318—135 **15 Claims**



1. Motion producing apparatus for moving an element along a given path, said apparatus comprising:

a linear actuator having a pair of output members, said actuator being energizable for reciprocally moving in synchronism each of said output members in opposite directions; and

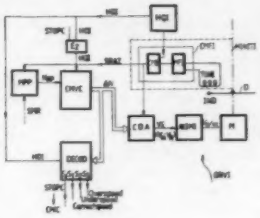
means for alternately magnetically coupling said output members to said movable element so as to progressively move said element in a given direction along said given path.

4,420,715

APPARATUS FOR CONTROLLING MOTOR SPEED

Georges Lecourtier, and Jean-Claude Bouquigny, both of Paris, France, assignors to CII Honeywell Bull, Paris, France

Filed Jul. 2, 1981, Ser. No. 280,084
Claims priority, application France, Jul. 11, 1980, 80 15547
Int. Cl.³ H02P 5/16
U.S. Cl. 318—301 12 Claims



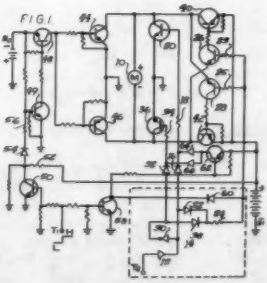
1. Apparatus for controlling the rotational velocity of a motor comprising a counter, means for resetting the counter in response to a shaft driven by the motor passing a reference rotational position during each turn of the shaft, means for stepping the counter at a predetermined fixed frequency a plurality of times between adjacent resettings of the counter, whereby the counter has a count at the time of the resetting indicative of the deviation between the actual shaft speed and a set shaft speed, the means for resetting including means for controlling the value to which the counter is reset each time the shaft passes the reference position, the value controlling means including means responsive to a deviation count derived from the counter each time the counter is reset and a signal commensurate with a count preset into the counter when the counter was last reset for adding the deviation count to the last preset count, means responsive to the counter for deriving a velocity control signal for the motor each time the counter is reset, the velocity control signal having a magnitude directly proportional to the deviation, whereby the velocity control signal has a zero amplitude in response to a zero deviation, and means for controlling the motor velocity in response to the velocity control signal.

4,420,716

DC MOTOR CONTROL APPARATUS

Kazuyoshi Imazeki, and Masao Nakano, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Filed Dec. 22, 1980, Ser. No. 219,314
Claims priority, application Japan, Dec. 29, 1979, 54-173098
Int. Cl.³ H02P 3/14
U.S. Cl. 318—379 9 Claims



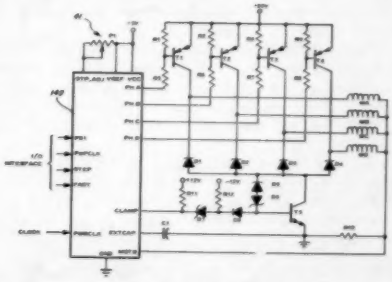
1. A DC motor control apparatus for controlling a DC motor, comprising: a first pair of switching elements coupled intermediate a ground potential and oppositely-poled ends of said DC motor respectively, a second pair of switching elements coupled intermediate a source of driving potential and oppositely-poled ends of said DC motor respectively, circuit means coupled with said first and second pairs of switching elements and responsive to respective first and second predetermined logic contents of a two-bit binary logic signal for respectively actuating a selected one of each of said first and second pairs of switching elements for establishing a current path for forward direction and reverse direction operation of said DC motor, respectively, and a third pair of switching elements connected intermediate ground potential and said oppositely-poled ends of said DC motor respectively, said circuit means being further responsive to a third predetermined logic content of said two-bit binary logic signal for simultaneously actuating both of said first pair of switching elements and both of said third pair of switching elements to form a current path for releasing an electromotive force of either polarity from said DC motor during braking from rotation in either direction thereof.

4,420,717

USE OF MOTOR WINDING AS INTEGRATOR TO GENERATE SAWTOOTH FOR SWITCH MODE CURRENT REGULATOR

Steven J. Wallace, and Paul L. Culley, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 6, 1980, Ser. No. 193,988
Int. Cl.³ H02K 29/04
U.S. Cl. 318—696 12 Claims



1. A printing terminal having a printing head movable by a stepper motor, an available DC power source, clocking means and means for selecting the coils of the stepper motor, comprising:

(a) power switching means connected to the DC power source and to the selected coil;

(b) control timing means connected to the power switching means for permitting the power switching means to close and open for a fixed cycle period, thereby respectively connecting the selected coil across and disconnecting from the DC power source;

(c) duty cycle varying means connected to the control timing means for activating the control timing means to vary the time of the power switching means to be opened and closed; and

(d) current sensing means connected to the selected coil for sensing the current flowing through the selected coil, and connected to the duty cycle varying means to activate the duty cycle varying means when the current reaches a predetermined level, and to deactivate the duty cycle varying means when the current drops below the predetermined level.

4,420,718

CONTROL SYSTEM FOR INDUCTION MOTOR USING INVERTER FOR AC POWER SUPPLY

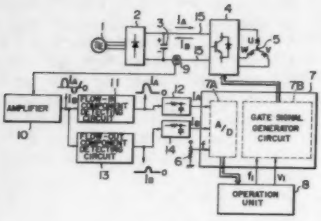
Keijiro Sakai; Yasuo Matsuda, both of Hitachi, and Mitsuyuki Honbu, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 2, 1981, Ser. No. 326,809

Claims priority, application Japan, Dec. 5, 1980, 55-170953; Jul. 1, 1981, 56-101176

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—729 **8 Claims**



1. A control system for an induction motor driven by an AC output of variable frequency and voltage produced from an inverter which converts DC power obtained by a converter through conversion of AC power having constant voltage and constant frequency, said system comprising:

means for determining the value of a power factor estimation function δ defined as function of a positive polarity component and and of a negative polarity component of an input current of said inverter;

means for progressively increasing the output voltage of said inverter when the value of the function δ is larger than δ_1 and decreasing the output voltage of said inverter when the value of the function δ is less than δ_2, where δ_1 and δ_2 are predetermined values of the function δ and $\delta_1 > \delta_2$, and

means for inhibiting the output voltage of said inverter from increasing beyond a predetermined upper limit and decreasing below a predetermined lower limit.

4,420,719

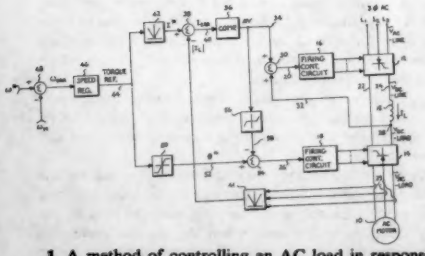
CROSS-TIED CURRENT REGULATOR FOR LOAD COMMUTATED INVERTER DRIVES

John D. D'Atre, Saratoga, N.Y., and Loren H. Walker, Salem, Va., assignors to General Electric Company, Salem, Va.

Filed Dec. 23, 1981, Ser. No. 333,929

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—803 **26 Claims**



1. A method of controlling an AC load in response to an operational control signal by means of a source side converter coupled from an AC source to a load side converter via a DC link and wherein said load side converter supplies power to said load, comprising the steps of:

(a) generating first and second reference signals from said operational control signal;

(b) sensing an operational parameter of the load;

(c) comparing the first reference signal against the operational parameter of the load in a first signal channel and generating an error signal for controlling the source side converter;

(d) normally controlling the load side converter in response to said second reference signal applied via a second signal channel;

(e) sensing the value of said error signal or a value derived therefrom and in the event said value exceeds a predetermined value thereafter providing a third signal while said value exceeds said predetermined value;

(f) cross coupling said third signal from said first signal channel to said second signal channel and combining said third signal with said second reference signal; and

(g) from step (f) generating a modified command signal to control said load side converter until said value no longer exceeds said predetermined value and said second reference signal again resumes normal control of said load side converter.

4,420,720

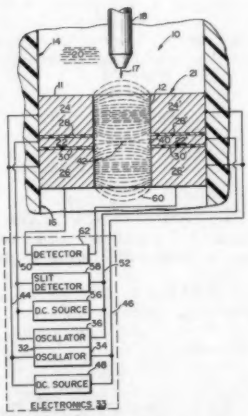
FIELD FOCUSED PARTICLE SENSING ZONE

William A. Newton, Dade County, Fla., and Marshall D. Graham, Framingham, Mass., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jun. 29, 1981, Ser. No. 279,920

Int. Cl.³ G01N *27/00*

U.S. Cl. 324—71.4 **28 Claims**



1. A particle analyzer apparatus comprising:

means for providing a flow of a liquid suspension, having individual particles entrained therein, along a predetermined path;

a first pair of metal plates positioned on opposed sides of said predetermined path;

first energizing means for providing an electrical sensing field extending from one of said first plates through said liquid suspension to the other said first plate;

field focusing means including a second pair of metal plates positioned on opposed sides of said predetermined path adjacent to one side of said first pair of plates and a third pair of metal plates positioned on opposed sides of said predetermined path adjacent to the opposed side of said first pair of plates;

said field focusing means further including second energiz-

ing means for generating an electrical second field between said plates of said second pair and for generating an electrical third field between said plates of said third pair;

said field focusing means further including field shaping means for angling at least a portion of said second and third fields in the direction of said sensing field to narrow the width of said sensing field along said predetermined path to a dimension less than the length of a given particle passing through said sensing field;

detector means coupled to said first pair of plates for detecting particle pulses caused by particles passing through said sensing field.

4,420,721

ELECTRICITY METERS

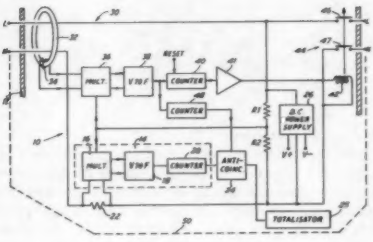
Howard A. Dorey, Godalming, England, and Anthony J. Ley, Sceaux, France, assignors to Sangamo Weston Limited, Enfield, England

Filed Feb. 9, 1981, Ser. No. 232,498

Claims priority, application United Kingdom, Feb. 7, 1980, 8004198

Int. Cl.³ G01R *11/24*

U.S. Cl. 324—110 **7 Claims**



1. An electricity meter for measuring the amount of electrical energy supplied by an electrical power supplier to an electrical power consumer via an electrical power distribution circuit consisting of at least two wires, the meter comprising:

current sensing means for sensing the current flowing in at least one of the wires;

means responsive to the current sensed by the current sensing means for deriving the energy measurement; and

fraud detection means for detecting attempts to fraudulently by-pass the meter, said fraud detection means comprising:

means arranged to produce a signal representative of the instantaneous value of the difference between the respective currents flowing to and from the consumer via the meter;

an electronic multiplier arranged to multiply the current difference representative signal by a signal representative of the instantaneous value of the voltage between the wires, to produce a signal representative of the product thereof; and

a resettable integrating circuit arranged continuously to receive said product representative signal and to integrate it for a predetermined time prior to each resetting hereof, said integrating circuit including means for producing a signal indicative of an attempt to by-pass the meter when the integral of the product representative signal exceeds a predetermined value within the predetermined time.

4,420,722

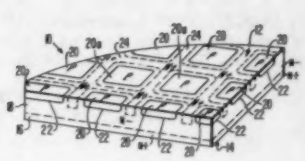
TESTING SEMICONDUCTOR FURNACES FOR HEAVY METAL CONTAMINATION

Albert A. Todd, Mountaintop, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 14, 1980, Ser. No. 206,715

Int. Cl.³ G01N *27/00, 27/12, 31/22*

U.S. Cl. 324—158 R **5 Claims**



1. A method of testing a semiconductor processing furnace for heavy metal contamination, said method comprising:

providing a chip of semiconductor material having first and second major surfaces, an outer N+ region extending into said chip from the first major surface, an intermediate N− region extending into said chip from the second major surface, a plurality of outer P regions extending into said chip from the second major surface so as to form a plurality of junctions with the N− intermediate region, and an N+ isolation region extending into said chip from the second major surface, said N+ isolation region being located between the P regions so as to electrically isolate the P regions from each other and from the side surface of the chip;

conveying said chip through the furnace to be tested while the furnace is operating under normal processing conditions;

measuring the reverse recovery time of said chip after it is withdrawn from said furnace; and

determining if the reverse recovery time has decreased.

4,420,723

PHASE LOCKED LOOP AMPLIFIER FOR VARIABLE AMPLITUDE RADIO WAVES

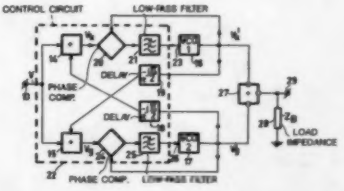
Frank de Jager, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1981, Ser. No. 248,607

Claims priority, application Netherlands, Apr. 1, 1980, 8001903

Int. Cl.³ H03F *3/38*

U.S. Cl. 330—10 **7 Claims**



1. An arrangement for generating an amplified modulated carrier signal the amplitude variations of which are smaller than the amplitude of the unmodulated carrier, characterized in that said arrangement comprises a first and a second controlled power oscillator, each having a control input and an output, and a control circuit connected to the respective control inputs of said first and second controlled power oscillators for making said oscillators oscillate at a substantially constant amplitude and at a frequency which substantially corresponds

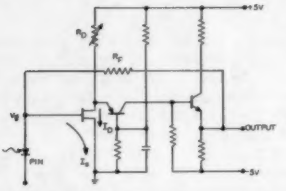
to the carrier frequency, the outputs of said oscillators being coupled to the control circuit for generating control signals for the oscillators from comparisons between the modulated carrier signal and the oscillator signals, the arrangement also comprising an output circuit connected to the outputs of the oscillators for vectorially assembling an output signal which is said amplified modulated carrier signal.

4,420,724

FET AMPLIFIER WITH WIDE DYNAMIC RANGE

Brian Owen, Upper Milford Township, Lehigh County, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 17, 1982, Ser. No. 378,739
Int. Cl.³ H03F 3/16, 3/08
U.S. Cl. 330—277 **4 Claims**



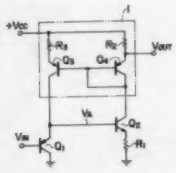
1. Amplifier for amplifying signals over a wide dynamic range from a first level to a second level higher than the first, the amplifier comprising a field effect transistor having a Schottky gate, means connecting the signal to be amplified to the Schottky gate, feedback means for adjusting the voltage on the Schottky gate in accordance with the voltage on the drain of the field effect transistor, and means for biasing the drain of the field effect transistor at a level producing substantial current flow from the Schottky gate to the source of the transistor over a significant part of said dynamic range near said second level.

4,420,725

WIDE-BANDWIDTH LOW-DISTORTION AMPLIFIER

Susumu Sueyoshi, and Kikuo Ishikawa, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 105,333, Dec. 19, 1979, abandoned. This application Sep. 22, 1980, Ser. No. 189,276
Claims priority, application Japan, Dec. 27, 1978, 53/163895; Dec. 29, 1978, 53/165071; Sep. 21, 1979, 54/121645
Int. Cl.³ H03F 3/18
U.S. Cl. 330—288 **8 Claims**



1. An amplifier comprising:

a first transistor to the base of which an input is applied, said first transistor being of a first conductivity type and having an emitter-collector current path for carrying a first emitter-collector current;

a second transistor having a base to which an output of said first transistor is applied, said base of said second transistor having a base current, said second transistor being of a second conductivity type opposite to said first conductivity type of said first transistor having an emitter-collector current path for carrying a second emitter-collector current;

current supplying means for providing a first current at a first current terminal connected in common to said emitter-collector path of said first transistor and to said base of said second transistor whereby said first current is substantially equal to the sum of said base current of said second transistor and said first emitter-collector current of said first transistor, and for providing a second current at a second current terminal connected to said emitter-collector current path of said second transistor, whereby said second current is substantially equal to said second emitter-collector current, a ratio of said first and second currents being constant; and

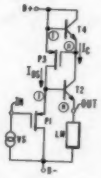
output means for providing an output voltage corresponding to variations in the current supplied to said second transistor.

4,420,726

VOLTAGE-FOLLOWERS WITH LOW OFFSET VOLTAGES

Allen L. Limberg, Titusville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 4, 1981, Ser. No. 271,026
Int. Cl.³ H03F 3/16
U.S. Cl. 330—288 **12 Claims**



1. In a circuit including:

first and second transistors each having respective input, output and common electrodes, said transistors being of respective first and second types that can exhibit respective first and second potentials of first and second opposite polarities between their respective input and common electrodes when currents flow in respective conduction paths between their respective output and common electrodes;

means for connecting said first and second transistors in cascade including a connection of the input electrode of said first transistor to an input point and for connecting the common electrode of said first transistor to the input electrode of said second transistor;

load means coupled to the conduction path of said second transistor for receiving the current flow therethrough; and

circuit means for conditioning said first transistor to exhibit said first potential of magnitude to compensate at least a portion of said second potential, said circuit means comprising:

a third transistor of said first type and having input, output and common electrodes; and

a current amplifier having an input connection to which the common electrode of said third transistor connects, having an output connection to which the common electrode of said first transistor is coupled, having a common connection against which the input electrode of said third transistor is biased, said current amplifier having an input circuit between its input and common connections for applying a potential of said first polarity between the input and common electrodes of said third transistor to establish a current in its conduction path, and having an output circuit between its output and common connections for applying a current directly related to the current in the conduction path of said third transistor to the common

electrode of said first transistor as substantially the entire current flow in its conduction path.

4,420,727

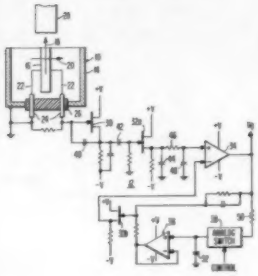
SELF OSCILLATING ACOUSTIC DISPLACEMENT DETECTOR

William G. Rau, Malvern, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 1, 1981, Ser. No. 307,484

Int. Cl.³ H01L *41/02*; G01R *23/12*; G01S *1/72*

U.S. Cl. 331—65 **7 Claims**



1. An acoustic displacement detector for detecting the position of an object with respect to a reference comprising:

a transducer having a housing formed of electrically conductive material coupled to a source of reference potential, a piezoelectric crystal disposed within said housing and establishing said reference, said crystal having orthogonally oriented mechanical and electrical axes, said object being positioned with respect to said crystal such that its extremity proximal to the latter lies in a plane substantially perpendicular to the mechanical axis of said crystal,

an oscillator network including a current amplifying device, electrical conductor means coupling said crystal to said oscillator network for generating oscillations, the acoustic energy generated by said crystal being transmitted along said mechanical axis thereof and being reflected from said extremity of said object back to said crystal, the phase of the reflected energy being a function of the position of said object with respect to said crystal and resulting in variations in the efficiency of energy storage in the latter, the amplitude of said oscillations being dependent upon said efficiency of energy storage, and

means for detecting changes in said amplitude of oscillations as indicative of a displacement in the position of said object.

4,420,728

ACOUSTIC WAVE DEVICES

David E. Bower, London, England, assignor to U.S. Philips Corporation, New York, N.Y.

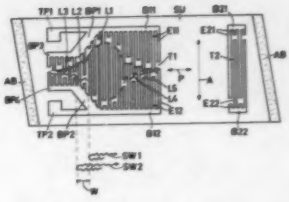
Filed Dec. 3, 1981, Ser. No. 327,142

Claims priority, application United Kingdom, Dec. 19, 1980, 8040796

Int. Cl.³ H03H *9/64*, *9/42*

U.S. Cl. 333—151 **11 Claims**

1. An acoustic wave device comprising a substrate able to propagate acoustic waves at a surface thereof, a transducer formed on said surface to launch or receive said acoustic waves at said surface along a propagation path through the transducer, the transducer including an interdigital array of two overlapping sets of electrodes with each set connected to one of two opposite bus bars, in which the length of the overlap envelope normal to the propagation path varies along the propagation path and the limits of the overlap envelope normal to the propagation path define the acoustic aperture of the transducer, and wherein each bus bar extends within the acoustic aperture, at least a part of each bus bar within the acoustic aperture being inclined to the propagation path and having a width W along the propagation path defined by $2W=n\lambda/2$



where n is an odd integer and λ is the wavelength of said acoustic waves at substantially the maximum amplitude response frequency of the transducer.

4,420,729

MICROWAVE PHASE-SHIFTING APPARATUS

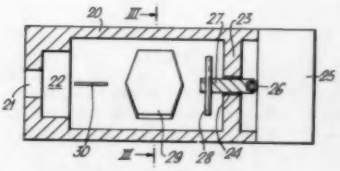
John V. Ashforth, Edinburgh, Scotland, assignor to Ferranti plc, Cheshire, England

Filed Apr. 9, 1982, Ser. No. 367,110

Claims priority, application United Kingdom, Apr. 24, 1981, 8112668

Int. Cl.³ H01P *1/18*, *1/165*

U.S. Cl. 333—159 **7 Claims**

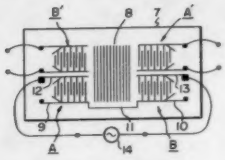


1. Microwave phase shifting apparatus which includes a section of waveguide of circular cross-section having a closed end and an open end and of a form which will support only a single mode of propagation at a required frequency, a fixed phase-shifting polarising member located in the waveguide section and of such dimensions and position within the section as to ensure that microwave energy directed from it towards the closed end of the section is circularly polarised, a shaft of dielectric material projecting through the closed end of the waveguide section along the longitudinal axis thereof for rotation about that axis, and a rotatable element supported by said shaft in a plane perpendicular to said axis between the polarising member and the closed end of the section, the form and position of the rotatable element being such that the element may be rotated about said axis such that linearly-polarised microwave energy entering the open end of the waveguide section is reflected out of the section with a reflection coefficient having unity magnitude and a phase angle component which may be continuously adjusted over a range of 360° in either direction.

4,420,730
SURFACE ACOUSTIC WAVE FILTER

Noboru Wakatsuki; Yuji Kojima, and Masaaki Ono, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 23, 1981, Ser. No. 314,430
Claims priority, application Japan, Oct. 25, 1980, 55-148881
Int. Cl.³ H03H 9/64, 9/70
U.S. Cl. 333—195 14 Claims

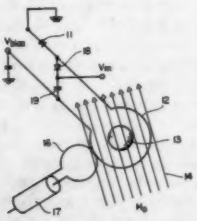


1. A surface acoustic wave filter comprising:
a substrate of piezoelectric material;
a multistrip coupler for changing the track of a signal comprising a plurality of parallel conductive strips;
at least two transducers disposed on one side of said multistrip coupler; and
at least another two transducers disposed on the other side of said multistrip coupler, the latter two transducers facing the former two transducers in which one pair of said transducers which face each other through said multistrip coupler constitute input transducers while the other pair of said transducers constitute output transducers, and in which said pair of output transducers are electrically disconnected from each other so that each output transducer receives an acoustic wave signal of different frequency.

4,420,731
CONTROLLED VOLTAGE YTTRIUM IRON GARNET (YIG) RESONATOR APPARATUS

Cristopher F. Schiebold, Los Altos, and William R. Green, La Honda, both of Calif., assignors to Watkins-Johnson Company, Palo Alto, Calif.

Filed Aug. 10, 1981, Ser. No. 291,618
Int. Cl.³ H01P 7/00, 5/04, 1/218
U.S. Cl. 333—219 4 Claims

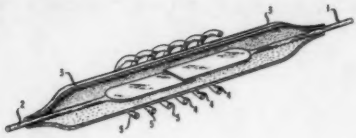


1. A controlled voltage YIG resonater comprising a YIG sphere, an input coupling loop coupled to said sphere, means providing a magnetic field to said YIG sphere, and a diode coupled to said resonator to limit the voltage developed across the resonator, said diode operating as a voltage clipping device which does not significantly detune the resonator.

4,420,732
MAGNETICALLY ACTUATED DEVICE COMPRISING A MAGNETICALLY ANISOTROPIC ELEMENT

Sungho Jin, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 194,252, Oct. 6, 1980, Pat. No. 4,337,100. This application Jan. 18, 1982, Ser. No. 339,903
Int. Cl.³ H01H 1/66, 51/00
U.S. Cl. 335—151 8 Claims

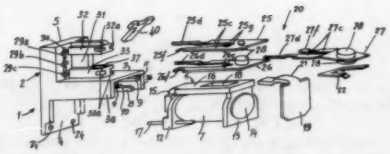


1. Device comprising electrical contact means and a magnetic component which is capable of being in at least two positions which here are designated as a first position and as a second position,
said component being in said first position or said second position depending on strength or direction or presence of a magnetic field,
said component comprising a body of a magnetically anisotropic metallic alloy having a magnetic squareness ratio which is greater than 0.7, and said body having remanent magnetic induction which is greater than 7000 gauss,
either said first position or else said second position being such that an electrical connection is formed between said contact means,
said device comprising means for exposing said body to at least a first magnetic field which causes said component to move from said first position to said second position,
said device being CHARACTERIZED IN THAT an amount of at least 95 weight percent of said alloy consists of Fe, Cr, and Mo,
Cr being in the range of 12–18 weight percent of said amount, and
Mo being in the range of 1–12 weight percent of said amount.

4,420,733
MINIATURIZED ELECTROMAGNETIC RELAY

Fabio V. Palandri, Milan, Italy, assignor to AMF Incorporated, White Plains, N.Y.

Filed Mar. 25, 1982, Ser. No. 361,716
Int. Cl.³ H01H 45/02, 50/04
U.S. Cl. 335—202 9 Claims



1. A miniaturized electromagnetic relay of the type having a yoke-coil-armature assembly and related return spring and contact bearing blades effective to be inserted into an insulating support structure formed by a front wall with a wall extending perpendicularly therefrom for separating said structure generally into two portions, with one portion being provided for receiving the yoke-coil-armature assembly and the return spring, while the other portion is provided for receiving said contact bearing blades, characterized in that:
the perpendicularly extending wall is generally of C-shaped cross-section having guiding and supporting means for receiving said yoke-coil-armature assembly and the return

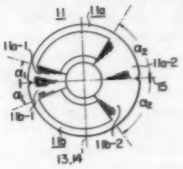
spring; the front wall contains a first and a second group of slots provided therein for receiving a portion of said contact bearing blades and a partition member disposed between said first and second group of slots having means effective to receive mating coupling means provided on said contact bearing blades to support said blades at a predetermined position with respect to said slots; and a parallel piped housing open only on one side and including locking means effective to cooperate with complementary means provided on said insulating supporting structure, thereby cooperating with said front wall to receive and enclose said supporting structure yoke-coil-armature assembly, spring and contact bearing blade.

4,420,734

DEFLECTING YOKE FOR USE IN PICTURE TUBE OF PROJECTION COLOR TELEVISION RECEIVER SET

Toshiharu Shimizu; Nobutaka Okuyama; Yoshikazu Naito, and Syuzo Matsumoto, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1982, Ser. No. 356,906
Claims priority, application Japan, Mar. 11, 1981, 56-33891
Int. Cl.³ H01F *5/00*
U.S. Cl. 335—213 **4 Claims**



1. A deflecting yoke for use in picture tubes of a projection color television receiver set adapted for reproducing color light images on a screen, said projection color television receiver set including first, second and third picture tubes for emitting red, green and blue light images, respectively,

said first, second and third picture tubes being juxtaposed to one another with respect to the screen,

light emitted from each of said first, second and third picture tubes being projected on the screen, and

said deflection yoke being used in outer-side ones of said three picture tubes, wherein said deflection yoke comprises:

(a) a core of a trumpet-like configuration made of magnetic material;

(b) a vertical deflection winding constituted by a pair of vertical deflection coils wound in a toroidal form on said core, said pair of vertical deflection coils producing vertical deflection magnetic fields within said core when a current is rendered to flow through said vertical coils, said vertical deflection magnetic field being operable to deflect an electron beam passing through the inside of said core in a vertical direction; and

(c) a horizontal deflection winding constituted by first and second horizontal coils each having a saddle-like configuration and disposed through and within said core, wherein each of said first and second horizontal coils has first and second side conductors,

said first side conductor having a first winding angular width and said second side conductor having a second winding angular width larger than the first winding angular width,

the first side conductor of said first horizontal coil and the first side conductor of said second horizontal coil being adjacent to each other and producing, in a pair, a first horizontal deflection magnetic field of a convex-like configuration in a space within said core when a horizontal deflection current is rendered to flow through said first and second horizontal coil, said first horizontal deflection magnetic field not only deflecting the electron beam passing through and within said core in a horizontal direction, but also deflecting the electron beam in a vertical direction so as to decrease the vertical width of a raster scanned on a face plate of said picture tube,

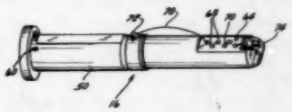
the second side conductor of said first horizontal coil and the second side conductor of said second horizontal coil being adjacent to each other and producing, in a pair, a second horizontal deflection magnetic field of a convex-like configuration in a space within said core when a horizontal deflection current is rendered to flow through said first and second horizontal coil, said second horizontal deflection magnetic field not only deflecting the electron beam passing through and within said core to the horizontal direction, but also deflecting the electron beam to the vertical direction so as to increase the vertical width of a raster scanned on a face plate of said picture tube, whereby the electron beam deflected by said vertical deflection magnetic field produced by said vertical deflection winding and said first and second horizontal deflection magnetic fields produced by said horizontal deflection winding forms a raster scanned on the face plate of said picture tube in a trapezoid form.

4,420,735

LOW CURRENT CLEARING BACK UP FUSE

Frank J. Muench, Jr., Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Jul. 20, 1981, Ser. No. 284,606
Int. Cl.³ H01H *85/30*
U.S. Cl. 337—244 **8 Claims**



1. An energy-limiting fuse comprising a housing, an electrically conductive cap at each end of said housing, a spider assembly positioned within said housing, said spider assembly including a fuse element and electrically conductive means at each end of said spider assembly for terminating said fuse element, means electrically connecting each conductive means to the corresponding cap,

said spider having a recess at one end and first electrical contact means mounted at the inner portion of the recess, a first strain wire mounted on said spider connecting said contact means to said conductive means at the end of said spider assembly remote from said recess, a striker pin assembly at least partially mounted in said recess and including a second electrical contact means for engaging said first contact means, a second strain wire for activating said striker pin assembly upon vaporization of said wire, said second strain wire connecting said second contact means to the conductive means at the other end of said spider assembly.

4,420,736

HEATING AND COOLING THERMOSTAT WITH LIMITING ACTION SELECTED BY A SINGLE LEVER CHANGEOVER SWITCHING APPARATUS

James H. Krueger, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 24, 1981, Ser. No. 334,407
Int. Cl.³ H01H *37/22*
U.S. Cl. 337—340 **7 Claims**

1. In a thermostat adapted for controlling heating and cooling apparatus comprising,

a base member,

temperature responsive switch means mounted on said base member,

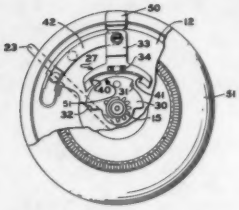
temperature control point adjustment means mounted on

said base member and connected to adjust the control point temperature of said temperature responsive switch means,

single lever changeover means mounted on said base member and connected to said temperature responsive switch means and adapted for selectively connecting either heating apparatus or cooling apparatus to said temperature responsive switch means,

temperature control point limit means connected to said temperature control point adjustment means,

first means connecting said single lever changeover means to said limit means to limit the range of movement of said control point adjustment means to a first range when said



lever is in the heating position and to a second range when said lever is in the cooling position,

said control point adjustment means has a knob attached to a shaft mounted on said base to rotate said shaft to a selected position for selecting a temperature control point of said temperature responsive switch means,

said limit means comprising

a pair of stop members mounted on said shaft,

a pivotal stop member mounted on said base member, and

said first means comprising a connection between said single lever to said pivotal stop member to select said first or said second range of operation by positioning said pivotal stop member to selectively engage one of said pair of stop members.

4,420,737

POTENTIALLY NON-LINEAR RESISTOR AND PROCESS FOR PRODUCING THE SAME

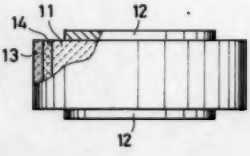
Tadahiko Miyoshi; Takeo Yamazaki, and Kunihiro Maeda, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 110,470, Jan. 8, 1980, abandoned. This application Oct. 30, 1981, Ser. No. 316,647

Claims priority, application Japan, Jan. 16, 1979, 54-2203

Int. Cl.³ H01C *7/12*

U.S. Cl. 338—21 **15 Claims**



1. A potentially non-linear resistor comprising a sintered product formed chiefly of a zine oxide sintered body, the side surfaces of said product being provided with a glass layer and the end surfaces of said product being provided with electrodes, wherein said glass layer comprises a lead borosilicate glass that further contains tin oxide in an amount of 0.4 to 10% by weight.

4,420,738

TEMPERATURE SENSOR

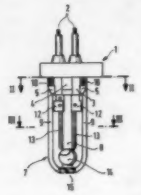
Wolfgang Rehmann, Asperg, and Rudolf Sauer, Benningen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1981, Ser. No. 306,976

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3044419

Int. Cl.³ H01C *7/04*

U.S. Cl. 338—28 **7 Claims**



1. A temperature sensor, intended in particular for an electronically controlled fuel injection system of an internal combustion engine, having a carrier body, said carrier body provided with electrical connections, said carrier body being further provided with a temperature-dependent resistor element, said carrier body being arranged to be received in a protective sheath surrounding said temperature-dependent resistor element, characterized in that said protective sheath is arranged to minimize contact between said temperature-dependent resistor element and said sheath, said protective sheath being provided with first and second apertures permitting free access to said temperature-dependent resistor element by a medium whose temperature is to be measured, said first and second apertures extending axially of said protective sheath, said first apertures comprising two apertures disposed in opposed relation to one another, said apertures opening on an end remote from said temperature-dependent resistor element, said second apertures comprising two apertures, at least one of which terminates in a crosspiece near said end, said crosspiece comprising a lock element provided on said protective sheath, and said carrier body and said protective sheath being connected together in a positively-engaged manner, said protective sheath having an elastically deformable end remote from said temperature-dependent resistor element, said carrier body provided with a protruding catch, said protective sheath further having a locking means, whereby said protruding catch and said locking means are brought into engagement when said carrier body is fully inserted into said protective sheath.

4,420,739

LIQUID-COOLED ELECTRICAL ASSEMBLY

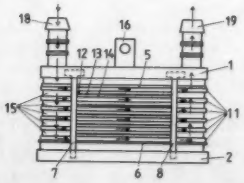
Peter Herren, Kirschbaumweg 11, 2563 Ipsach, Switzerland

Filed Aug. 31, 1981, Ser. No. 297,630

Claims priority, application Switzerland, Sep. 15, 1980, 6888/80

Int. Cl.³ H01C *1/08*

U.S. Cl. 338—53 **19 Claims**



1. In a liquid-cooled electrical assembly containing an arrangement for cooling at least one electrical component with

current flowing through it and having a coolant liquid flowing into an inlet of a cooler and heated-up coolant removed from the cooler through an outlet, the improvement which comprises:

the cooler comprising substantially sheet-like cooling elements each having an inlet opening and an outlet opening for the coolant;

the cooling elements and electrical components being alternately stacked together to form a pile;

the inlet opening of each cooling element being directly connected with a liquid coolant inlet of the cooler;

the outlet opening of each cooling element being directly connected with a liquid coolant outlet of the cooler;

each said inlet opening and outlet opening of each cooling element having a lengthwise axis disposed substantially perpendicular to a plane containing such cooling element; and

said inlet openings and said outlet openings of said cooling elements mutually interconnecting said cooling elements in flow communication with one another.

4,420,740

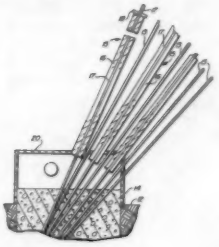
OBSTRUCTION WARNING SYSTEM

Herbert L. Brown, 671 Golf Course Dr., Ft. Walton Beach, Fla. 32548, and Frederick J. Mayer, 1107 Clark St., Tallahassee, Fla. 32301

Filed Aug. 31, 1981, Ser. No. 297,637

Int. Cl.³ B64D *47/00*; G08G *5/00*

U.S. Cl. 340—28 **11 Claims**



1. An obstruction warning system comprising in combination:

elongated optical light path means having a volume capable of transmitting light therethrough;

at least one light source operatively connected to one end of said optical light path means for directing a light thereinto;

reflecting means attached to the other end of said elongated optical light path means for reflecting light from said light source;

support means for supporting said optical light path means in a predetermined position adjacent an obstruction; and

means to interrupt light from said light source along said optical path means to produce increased visibility of said elongated optical light path means.

4,420,741

TRIM TAB POSITION MONITOR AND DISPLAY DEVICE

Donald O. West, P.O. Box 3673, Lacey, Wash. 98503

PCT No. PCT/US81/01060, § 371 Date Aug. 6, 1981, § 102(e) Date Aug. 6, 1981, PCT Pub. No. WO83/00579, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 6, 1981, Ser. No. 297,530

Int. Cl.³ G08B *23/00*; B63B *1/22*

U.S. Cl. 340—29 **5 Claims**

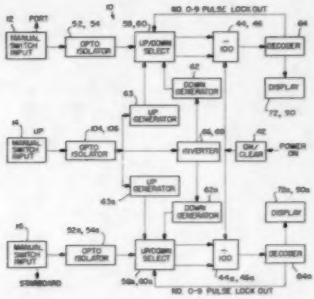
1. On a boat having stern trim-tab means, power actuator means for said trim tab means and electrical control means for said power actuator means, the improvement of a trim-tab position monitor and display device, comprising:

a. an enabling circuit means for receiving first, second and third pulses,

b. coupling circuit means connecting said device to said trim-tab electrical control means, said electrical control means providing first raise or lower trim-tab pulses to said coupling circuit means which in turn is connected to and conducts said first pulses to said enabling circuit means,

c. timer circuit means connected to said enabling circuit means for generating second timed pulses and conducting the same to said enabling circuit means,

d. decoder circuit means connected to said enabling circuit means to provide a third enabling pulse to said enabling circuit means,



e. said enabling circuit means adapted to pass said second pulses to a counter circuit means upon the existence of predetermined conditions in said first, second and third pulses,

f. counter circuit means connected to said enabling circuit means for accepting said second timed pulses from said enabling circuit means and to count the same,

g. said decoder circuit means also connected to said counter circuit means for accepting pulses from said counter circuit means for selectively energizing a visual display panel; and

h. said visual display panel connected to said decoder circuit means and having light emitting diodes in a predetermined display arrangement to indicate the position of said trim tab means between full up and full down positions.

4,420,742

SCAN SIGNAL PROCESSING SYSTEM

Masaharu Tadauchi, Hitachi; Kiyohiko Tanno, Katsuta, and Taizoh Nakano, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed May 4, 1981, Ser. No. 260,090

Claims priority, application Japan, May 9, 1980, 55-60565; May 9, 1980, 55-60566

Int. Cl.³ H03K *13/00*

U.S. Cl. 340—347 AD **15 Claims**

1. A scan signal processing system for converting an analog scan signal into a multi-level signal, the analog scan signal including a shading profile substantially common to each scan line, comprising:

input means adapted for receiving said analog scan signal;

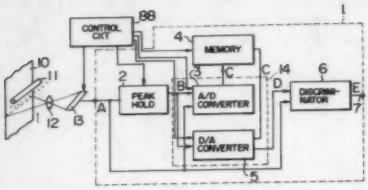
peak hold means connected to said input means, for detecting a peak of the analog scan signal and holding a corresponding peak value;

digital memory means for storing and supplying digital data;

converter means connected to said input means, said peak hold means, and said memory for normalizing said analog scan signal on a basis of said peak value, converting the

normalized signal into a digital signal and supplying the digital signal to said memory means, and also for denormalizing the digital signal supplied from said memory means on the basis of said peak value to supply the analog reference signal; and

discriminator means connected to said input means and said converter means for receiving said analog scan signal and



said analog reference signal, discriminating the analog scan signal based on the analog reference signal and producing a multi-level signal;

the memory means and the converter means being adapted to be controlled to store a shading profile in the memory means in an initial scan period and producing shading characteristic using the stored shading profile and the peak value in a following scan period.

4,420,743

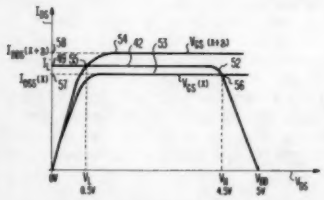
VOLTAGE COMPARATOR USING UNEQUAL GATE WIDTH FET'S

Lakshminarasimha C. Upadhyayula, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 120,333, Feb. 11, 1980, abandoned. This application Dec. 24, 1981, Ser. No. 334,257

Int. Cl.³ H03K *13/02, 13/175*

U.S. Cl. 340—347 AD **3 Claims**



1. An apparatus for detecting the amplitude of an input signal relative to a predetermined threshold voltage, said apparatus comprising:

first and second field effect transistors (FET's), each having gate, source and drain electrodes;

said first FET having its gate electrode coupled to its source electrode, and having a first gate electrode width to provide with a potential across said first FET a predetermined reference load current level through said first FET establishing said predetermined threshold voltage;

said second FET having a second gate electrode width greater than said first width to thereby provide with a potential across said second FET, in response to a range of values of said input signal to said second FET gate electrode, a corresponding range of saturation current levels above and below said load current;

said first and said second FET's connected in series across a source of potential; and

means for coupling said input signal to said second FET gate electrode whereby when said input signal changes from a value which produces a saturation current level through said second FET above said load current to a value which produces a saturation current level through said second FET below said load current the output level across said second FET changes.

4,420,744

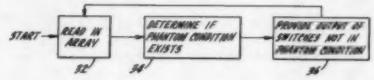
KEYBOARD CROSSPOINT ENCODER HAVING N-KEY ROLLOVER

Joseph E. Jesson, Lake Villa, Ill., assignor to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Feb. 12, 1981, Ser. No. 233,903

Int. Cl.³ G08C *25/00*

U.S. Cl. 340—365 E **6 Claims**



4. A method of operating a crosspoint encoder including the steps of detecting which crosspoints are closed, determining whether a phantom switch condition exists and providing an output of those crosspoints which are not involved in a phantom switch condition.

4,420,745

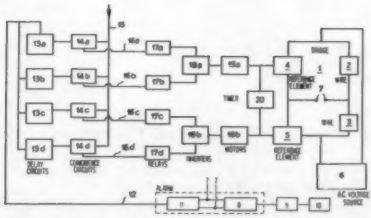
SECURITY SYSTEM

Jacques Dray, and Paul P. Canobbio, both of Senlis, France, assignors to Societe Anonyme Trefilunion, Saint-Dizier, France

Continuation-in-part of Ser. No. 96,447, Nov. 21, 1979, abandoned. This application Dec. 8, 1981, Ser. No. 328,646 Claims priority, application France, Dec. 5, 1978, 78 34188

Int. Cl.³ G08B *29/00*

U.S. Cl. 340—510 **11 Claims**



1. A security system for indicating an intrustion into an area being protected, comprising

(a) a bridge circuit (1) including four branches and having pairs of input and output (7) terminals, said bridge circuit being subject to drift due to a shift in phase of an output signal produced at said output terminals relative to an input signal at said input terminals;

(b) an alternating current voltage source (6) connected with said bridge circuit input terminals;

(c) first and second conduting elements (2, 3) connected in two adjacent bridge branches, respectively;

(d) a pair of reference elements (4, 5) connected in the remaining two bridge branches, respectively, at least one of said reference elements having a variable impedance;

(e) intrusion indicating means, including

(1) means (8) connected with said output terminals for monitoring the impedance of one of said conducting elements;

(2) means (9) connected with said monitoring means to produce an alarm signal in response to a change in the impedance of said one conducting element resulting from an intrusion; and

(3) alarm circuit means (10) connected with said alarm signal producing means for activating an alarm in response to said alarm signal; and

(f) means for compensating for said bridge circuit drift, comprising

(1) phase shift detetor means (11) connected with said output terminals for producing a drift signal corresponding to the output signal phase shift; and

(2) means connected with said phase shift detector means for modifying the impedance of said one reference element in response to said drift signal.

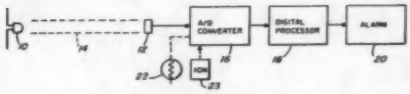
4,420,746
SELF-CALIBRATING SMOKE DETECTOR AND METHOD

William J. Malinowski, Johnson St., P.O. Box 274, Bryantville, Mass. 02327

Continuation-in-part of Ser. No. 61,186, Jul. 27, 1979, Pat. No. 4,266,220. This application Mar. 24, 1981, Ser. No. 246,960

Int. Cl.³ G08B *17/10*

U.S. Cl. 340—630 8 Claims



1. The method of detecting an aerosol such as smoke in a gaseous medium, comprising the steps of

(a) directing at least one beam of light through said medium,

(b) converting the light energy of said beam after passing through said medium to analog electrical signals,

(c) converting said analog signals to digital signals,

(d) cyclically and at relatively long intervals quantifying said digital signals and storing the quantity as a reference in place of the previous quantity,

(e) cyclically and at relatively short intervals quantifying said digital signals and comparing the short interval quantity with the reference,

(f) actuating an alarm in the event that any difference between the short interval quantity and the reference exceeds a predetermined amount,

(g) measuring the ambient temperature to obtain second analog electrical signals corresponding to said temperature,

(h) converting said second analog signals into second digital signals, and,

(i) applying said second digital signals to said first-mentioned digital signals at short intervals as a compensation for short term thermal effects in the conversion of said light energy to said first-mentioned analog signals.

4,420,747
SHEET FEED MONITORING SYSTEM

Werner Kistner, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 172,930, Jul. 28, 1980. This application Oct. 6, 1980, Ser. No. 194,450

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930270

Int. Cl.³ G08B *21/00*

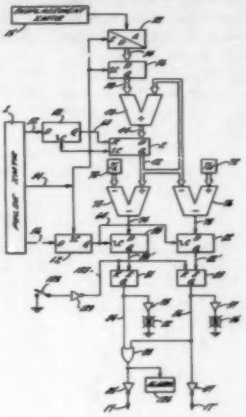
U.S. Cl. 340—674 10 Claims

1. A method of determining whether a sheet feed mechanism is feeding a predetermined number of superimposed sheets to a sheet processing machine during a given feed cycle comprising the steps of:

obtaining a plurality of measured values that are functionally related to sheet thickness at distinct points on the surface of the superimposed sheets, while the superimposed sheets are passing to the sheet processing machine,

converting the measured values to digital, numeric representation,

totalling the numeric values in a digital accumulator register, and



comparing the total to a predetermined reference value, wherein the reference value is computed by averaging the totals obtained from previous sheet feeds where single sheet feeds were detected.

4,420,748
PASSIVE DATA DISPLAY AND METHOD AND MEANS FOR CONTROL AND MONITORING THEREOF

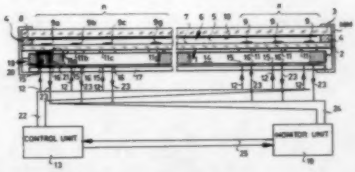
Appenrodt Jürgen, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Filed Dec. 16, 1980, Ser. No. 217,036

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951584

Int. Cl.³ G09G *3/18*

U.S. Cl. 340—715 12 Claims



1. A display arrangement, comprising:

a passive data display including a plurality of sets of segments, each set of segments being arranged so that activation of selected segments in any one of the sets produces an image of a desired symbol,

a plurality of contacts each connected to a segment of said display,

a printed circuit board having a pair of separate conductor leads facing each of said contacts,

laminated elastic connector means having a pair of faces and a plurality of conductors extending between the faces,

said connector means being positioned between the contacts and said conductor leads on said printed circuit board, and

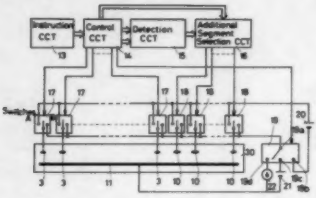
means for applying operating signals to said segments through one of said leads, and

means for sensing the operation of said segments through the other of said leads on said printed circuit board.

4,420,749
CHARGE TRANSFER TYPE ELECTROCHROMIC DISPLAY DEVICES

Katubumi Koyanagi; Hiroshi Hamada, both of Nara; Kohzo Yano, Yamatokoriyama; Hiroshi Take, Ikoma, and Yasuhiko Inami, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 24, 1981, Ser. No. 276,970
Claims priority, application Japan, Jun. 30, 1980, 55-89847
Int. Cl.³ G09G *3/16*
U.S. Cl. 340—763 **11 Claims**



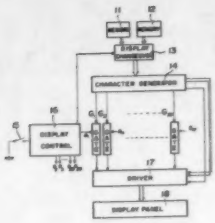
1. An electrochromic display device comprising:
display segmented electrode means comprising a layer of electrochromic material;
additional electrode means comprising a layer of electrochromic material;
counter electrode means opposed to the display segmented electrode means;
electrolyte means interposed between the display segmented electrode means and the counter electrode means;
charge absorbing means connected between said display segmented electrode means, said additional electrode means and said counter electrode means for absorbing charges present in colored display segmented electrode means and in colored additional electrode means through the counter electrode means; and
charge adding means connected between said display segmented electrode means, said additional electrode means and said counter electrode means for adding, through the counter electrode means, charges to the display segmented electrode means and the additional electrode means from which charge is removed;
whereby a display pattern is changed by transferring charge among the display segmented electrode means and the additional electrode means and the total charge of the colored display electrode means and the colored additional electrode means is kept constant.

4,420,750
ALPHANUMERIC VISUAL DISPLAY OF THE MATRIX TYPE

Naonori Okabayashi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 28, 1980, Ser. No. 135,156
Claims priority, application Japan, Mar. 30, 1979, 54-39045
Int. Cl.³ G09G *3/00*
U.S. Cl. 340—791 **8 Claims**

1. A display device comprising
a display panel having a matrix type display pattern defined by a number of columns, at least two columns being necessary to display each character or number;
a pattern generator; and
means responsive to said pattern generator for constraining said display panel to display numerical or character information by sequentially changing column by column the display state of said panel at a perceptible rate to simulate the left to right writing or erasing of said information by a human being, said sequentially changing display state varying the appearance of each character of said display

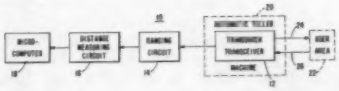


panel while the relative position of each said character on said display panel remains stationary.

4,420,751
DETECTION METHOD AND APPARATUS FOR A USER DEVICE OR AUTOMATIC TELLER BANK MACHINE

Bruno J. Paganini, Centerville, and William J. Hale, Dayton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 29, 1981, Ser. No. 316,378
Int. Cl.³ H04Q *9/00*; G08B *13/00*
U.S. Cl. 340—825.33 **20 Claims**

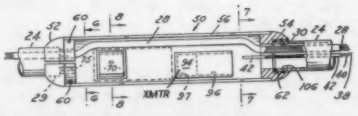


1. A detector apparatus for providing control signals for controlling operation of an automatic teller machine comprising: determining means for determining whether or not a user is present within a defined user area associated with said machine and a user operating zone within said user area, said determining means comprising distance measurement means for providing distance indicating electrical signals indicative of the instantaneous distance of said user from said machine, and a computer means coupled to said distance measurement means for receipt of said distance indicating electrical signals to provide said control signals in response thereto.

4,420,752
REAL-TIME PARAMETER SENSOR-TRANSMITTER

Murray W. Davis, 20501 Woodmount, Harper Woods, Mich. 48225; Matthew J. Diedzic, Dearborn, Mich.; Robert F. Knapp, Livonia, Mich., and Bruce F. Whitney, South Lyon, Mich., assignors to Murray W. Davis, Harper Woods, Mich.

Division of Ser. No. 888,143, Mar. 20, 1978, Pat. No. 4,268,818.
This application Jan. 9, 1981, Ser. No. 223,608
Int. Cl.³ G01D *5/12*; H04B *3/54*
U.S. Cl. 340—870.17 **37 Claims**



1. In an apparatus for measuring at least one parameter on a real time basis and including an electrically energizing alternating current carrying conductor and a transmitter for transmitting a signal proportional to said parameter, the improvement comprising:

means for receiving induced energy from said energized conductor for energizing said transmitter including a plurality of turns of wire wound around a mandrel, said plurality of turns of wire formed as the secondary winding of a transformer and said mandrel being at the same electrical potential as said conductor; and

means for coupling the output of said transmitter back to said conductor in the form of an induced current so that said conductor also functions as the transmission medium for said transmitter output.

4,420,753

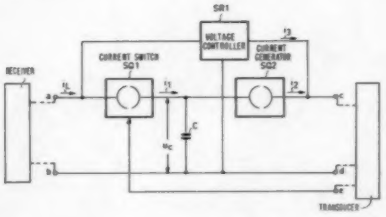
CIRCUIT ARRANGEMENT FOR THE TRANSMISSION OF MEASUREMENT VALUE SIGNALS

Dietrich Meyer-Ebrecht, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 611,819, Sep. 9, 1975, abandoned. This application Aug. 19, 1977, Ser. No. 825,965

Int. Cl.³ G08C *19/12, 19/00, 25/02*

U.S. Cl. 340—870.26 **11 Claims**



1. A circuit arrangement for coupling a measuring transducer to a remote receiver via a two-wire circuit which two-wire circuit at the same time supplies electric power from a remote voltage source for the operation of the measuring transducer, the circuit arrangement comprising, at the measuring transducer end of the two-wire circuit, first and second terminals coupled to the two-wire circuit, a current switch and a voltage controller connected to said first and second terminals of the two-wire circuit, third and fourth terminals connected to the measuring transducer to supply electric power thereto, said voltage controller being responsive to the voltage supplied between said first and second terminals of the two-wire circuit for converting said voltage into a constant voltage which it applies to said third and fourth terminals, said measuring transducer producing a frequency-analog measurement signal whose frequency is determined by the quantity measured by the transducer, electric power storage means, means including the current switch for charging the electric power storage means with current pulses taken from the remote voltage source, said current pulses having a repetition frequency equal to the frequency of the frequency-analog measuring signal so that the frequency of said current pulses is a measure of the transducer measurement-value signal, a current generator, and means including said current generator for coupling the power storage means to said third and fourth terminals so that the power storage means supplies a part of the operating current of the measuring transducer.

4,420,754

MEASURING DEVICE FOR CAPACITIVE DETERMINATION OF THE RELATIVE POSITION OF TWO WITH RESPECT TO ONE ANOTHER MOVEABLE PARTS

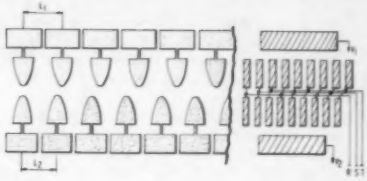
Nils I. Andermo, Täby, Sweden, assignor to Stiftelsen Institutet for Mikrovagsteknik vid Tekniska Hogskolan, Stockholm, Sweden

Continuation of Ser. No. 964,961, Nov. 30, 1978, abandoned. This application Jun. 9, 1981, Ser. No. 272,072

Claims priority, application Sweden, Dec. 9, 1977, 7714010

Int. Cl.³ G08C *19/10*

U.S. Cl. 340—870.37 **3 Claims**



1. A measuring device for capacitative determination of the relative position of two relatively movable parts with respect to one another, such as the scale and a slide of a hand manipulated measuring device comprising a slide provided with a number of groups of supply electrodes distributed along the direction of relative movement, each of the groups having n number of supply electrodes, n being an integer greater than 2, signal generator means having n number of signal outputs, each of the supply electrodes in each group being connected to a respective one of said signal outputs whereby all supply electrodes are supplied with voltages according to a cyclic pattern, the slide also being provided with at least one receiving electrode, a signal processing unit connected to at least one receiving electrode, the scale being provided with a single electronic pattern comprising internally galvanically isolated scale electrodes, each scale electrode comprising two mutually galvanically connected parts, one being a detecting part and being located close to the area of the scale over which the supply electrodes of the slide can be moved, the other of the two parts being a transferring part and being located close to the area over which the at least one receiving electrode of the slide can be moved, whereby the position of the slide along the scale generates a signal from the at least one receiving electrode which is derived from at least two adjacent supply electrode signals and the position of the slide with respect to the scale can be determined by the identification in the signal processing unit of the signals and their amplitude ratio.

4,420,755

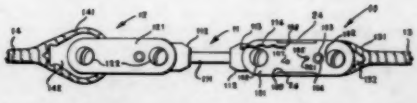
TELEMETRY LOAD LINK ASSEMBLY

Robert J. Primbs, Jr., Layton, Utah, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 21, 1981, Ser. No. 295,034

Int. Cl.³ G08C *19/04;* **B64D** *1/00*

U.S. Cl. 340—870.38 **3 Claims**



1. An improved mid-air recovery system having an aircraft with a winch and cable, said cable having a hook for capturing

a parachute descending object, said improved mid-air recovery system comprising:

a telemetry load link assembly attached to said cable to measure and to transmit strain in said cable while said object is attached to said cable on said aircraft, said telemetry load link assembly having a load link rotatably connected to said cable, a load sensing link rotatably connected to said load link, and a telemetry load link rotatably connected between said load sensing link and said cable, said telemetry load link having a transmitter for receiving strain data from said load sensing link and for transmitting an RF strain signal, a housing for fixedly holding said transmitter and for holding a power supply for said transmitter in said telemetry load link, bolting means for connecting said telemetry load link to said load sensing link and said cable, a loop guide for connecting said cable to said bolting means, and a stabilizing pin for damping out oscillations between said telemetry load link and said cable;

a receiver located in said aircraft to receive said RF strain signal, said receiver outputting a strain signal; and strain monitor means for receiving said strain signal from said receiver and for outputting transformed strain data to be interpreted by a winch control for controlling a rate of winching of said cable that has hooked thereon said object to be recovered.

4,420,756

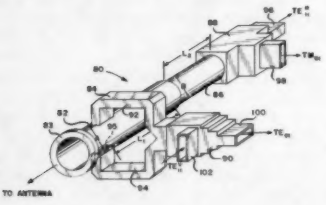
MULTI-MODE TRACKING ANTENNA FEED SYSTEM

Shinobu J. Hamada, Ranch Palos Verdes, and Taro Yodokawa, La Palma, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jan. 19, 1981, Ser. No. 226,328

Int. Cl.³ G01S *13/44*

U.S. Cl. 343—16 M **14 Claims**



1. An apparatus for coupling linearly polarized electromagnetic wave energy including at least a first, a second, and a third waveguide mode of propagation, each having a predetermined frequency, to at least three channels; the apparatus comprising:

broadband means for coupling a first linearly polarized signal of said first waveguide mode to a first channel including a first portion comprising a first circular waveguide section characterized by a cutoff frequency less than said predetermined frequency for said first, second, and third waveguide modes and a second portion comprising a second circular waveguide section coaxially coupled to said first circular waveguide section and having a cutoff frequency less than said predetermined frequency for said first and second waveguide modes but greater than said predetermined frequency for said third waveguide mode,

broadband means for coupling a second linearly polarized signal of said second waveguide mode to a second channel,

broadband means for coupling a third linearly polarized signal of said third waveguide mode to a third channel,

said means for coupling said second linearly polarized signal comprising a first E-plane folded hybrid junction coupled to said second circular waveguide section and having an E-port for propagating said second waveguide mode,

said means for coupling said third waveguide mode signal comprising a second E-plane folded hybrid junction having an E-port for propagating said third waveguide mode,

a two-port turnstile junction coupled at a first end to diametrically opposed aperture points on said first circular waveguide section and coupled at a second end to said second E-plane folded hybrid junction, and

means for coupling a signal at a predetermined frequency, different from said predetermined frequency for said first, second, and third waveguide modes, from a fourth channel in a waveguide mode equal to one of said first, second and third waveguide modes, for propagation of a linearly polarized signal.

4,420,757

METALLIZED SHEET FORM TEXTILE MATERIAL AND METHOD OF MAKING SAME

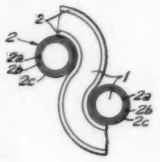
Harold Ebneth, Leverkusen, and Hans-Georg Fitzky, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 89,712, Oct. 30, 1979, Pat. No. 4,320,403. This application Jul. 6, 1981, Ser. No. 282,105

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847485

Int. Cl.³ H01Q *15/14*

U.S. Cl. 343—912 **11 Claims**



1. In a method of reflecting radar waves, the improvement comprising using as a reflecting material, metallized filamentary woven textile material composed of synthetic polymers and/or natural fibers with nickel and an additional metallized layer thereover applied after activation thereof with a total metal layer thickness of from 0.02 to 2.5 μm by currentless wet-chemical deposition and having a reflection loss of no greater than 0.9 dB and a protective layer on the material and over the metal layer.

4,420,758

ELECTROTHERMIC NON-IMPACT RECORDING METHOD AND APPARATUS

Yukio Tabata, and Toshiyuki Kawanishi, both of Numazu, Japan, assignors to Ricoh Company, Ltd., Japan

Filed May 26, 1982, Ser. No. 382,099

Claims priority, application Japan, May 26, 1981, 56-79848; May 26, 1981, 56-99164

Int. Cl.³ G02B *7/06*

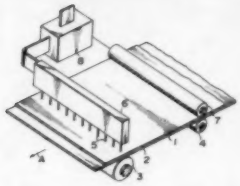
U.S. Cl. 346—76 PH **9 Claims**

7. An electrothermic non-impact recording apparatus for printing with electroconductive thermal-transferable ink on a receiving surface comprising:

a recording electrode means comprising (i) a plurality of recording styli spaced at a predetermined distance from each other, which recording styli are in contact with an electroconductive ribbon comprising a thermal-transferable ink, in order to allow current to flow through said ink ribbon and to generate Joule's heat therein, and (ii) a return electrode which is in contact with said ink layer, and is disposed at a predetermined distance from said recording styli, with the total contact area with said ink

ribbon of said recording styli being smaller than the contact area with said ink ribbon of said return electrode;

an image-delineating signal application means which is connected to said recording styli and to said return electrode and applies a predetermined image-delineating voltage across each portion of said ink ribbon between said recording styli and said return electrode, through resistor elements, each of which is inserted between one of said recording styli and one of the output terminals of said image-delineating signal application means from which said image-delineating electric current is output, the resistance of each resistor element being in the range of 1/10 to 10 times the resistance between the portion of said ink



ribbon between each recording stylus and said return electrode, thus causing said image-delineating electric current to flow through the portions in said ink ribbon immediately below said selected recording styli and to generate Joule's heat in said portions, by which Joule's heat said thermal-transferable ink material in said portions is melted and made transferable;

a reciprocating means for reciprocating said recording electrode means, passing over the surface of said recording medium, with said recording electrode means being in contact with said ink ribbon; and

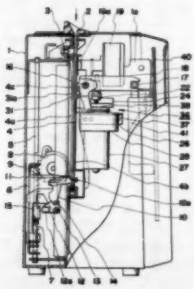
a winding means for winding said ink ribbon thereon in the course of recording process in synchronization with the movement of said recording electrode means.

4,420,759

CARD LOCKING DEVICE FOR TIME RECORDER

Kenji Maejima, Yokohama, Japan, assignor to Amano Corporation, Yokohama, Japan

Filed Feb. 26, 1981, Ser. No. 238,556
Claims priority, application Japan, Mar. 14, 1980, 55-32472
Int. Cl.³ G07C *1/08*
U.S. Cl. 346—82 **6 Claims**



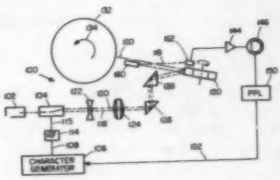
1. A card locking device for a time recorder of the kind arranged to receive a time card into a card guide passage thereof causing a switch to be turned on to actuate a motor which displaces a wire type dot matrix printer transversely relative to the direction of the insertion of the time card therein to print a variety of items on specific printing columns of the time card, said card locking device comprising: a locking lever having a from part, said front part including a locking piece located on one side of the card guide passage; a locking counter-plate spaced from said locking piece located on the side of the card guide passage opposite said one side, said locking lever containing a spring means for resiliently rotating said locking lever toward the card guide passage so as to clamp the inserted time card between said locking piece and said locking counter-plate; and first cam means for engaging said locking lever to displace said locking lever away from the card guide passage against the resilient force of said spring means, said first cam means being responsive to rotation of the motor when actuated by the switch, to disengage said locking lever from said first cam means so that said spring means rotates said locking lever against the inserted time card to clamp the inserted time card so as to be immovable, and to displace said locking lever apart from the card guide passage to disengage said locking lever from the time card.

4,420,760

PRINTER BEAM POSITION FEEDBACK SENSOR

Edwin R. Phillips, Rosemont, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,757
Int. Cl.³ G01D *9/42, 15/10*
U.S. Cl. 346—108 **4 Claims**



1. A printer beam position feedback sensor apparatus for use in laser printers said printers having a light source for transmitting a collimated light beam along a first path, a character generator and a light beam modulator connected thereto, said light beam modulator responsive to modulation signals from said character generator to modulate said light beam, said apparatus comprising:

rotating reflection means disposed within said first path for sweeping said light beam incident thereon at a constant rate within a planar region;

a surface to be swept, said surface disposed to intercept said planar region along a straight line;

a circular reflecting and beam splitting means disposed between said rotating reflection means and said surface and disposed at least partially within said planar region for reflecting at least a portion of said beam along a synchronization path, said circular reflecting beam splitting means including a base member having a first circular surface, a reflective member adjacent said first circular surface, means for forming a grid pattern with said reflective member, said grid forming means including a grid member adjacent said reflective member having a plurality of slots formed therein, and means for retaining and exposing said reflective and grid members including a cap member having a second circular surface urged toward said first circular surface by a fastening member, said reflective and grid members being retained between said first and second circular surfaces, said cap member having a slot formed therethrough for exposing said reflective and grid members

a photodetector means dispatch to receive light signals from said circular reflecting and beam splitting means and to transmit electrical signals in response to said received light signals; and

circuitry means connected between said photodetector means and the character generator to provide amplified

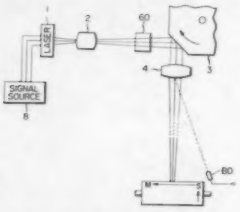
feedback synchronization signals to said character generator upon receipt of electrical signals from said photodetector means.

4,420,761

SCANNING RECORDING APPARATUS

Takashi Kitamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1982, Ser. No. 381,686
Claims priority, application Japan, Jun. 10, 1981, 56/89257
Int. Cl.³ G01D *9/42, 15/10*
U.S. Cl. 346—108 12 Claims



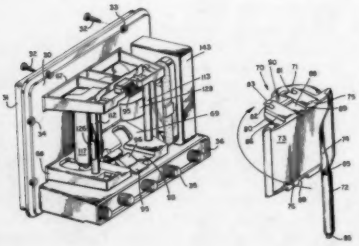
1. A scanning recording apparatus, comprising:
recording means for forming plural dots in the subsidiary scanning direction;
clock generator means for generating a clock signal; and
control means for forming, from the clock signal generated by said clock generator means, plural reference signals having the same frequency but a different phase from that of the clock signal, and for controlling said recording means by the plural reference signals.

4,420,762

CHART RECORDER

Wayne S. Andrews, Abbeville, Ala., assignor to Techsonic Industries, Inc., Eufaula, Ala.

Filed Feb. 1, 1982, Ser. No. 344,381
Int. Cl.³ G01D *15/24*
U.S. Cl. 346—136 28 Claims



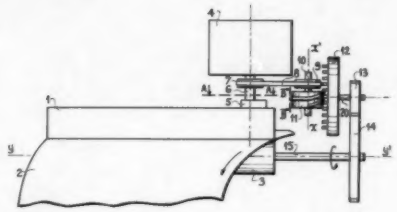
1. Apparatus for recording variable data on a movable recording medium, comprising:
means supporting a recording medium relative to a marking location;
marking means movable along a closed path traversing said recording medium at said marking location, and including a member contacting said medium and operative to mark the recording medium at selected locations;
said closed path traversed by the marking member including a first portion on which the recording medium is supported at said marking location, and including a second portion apart from the recording medium; and
means disposed along said second portion for contact by said marking member moving along the second portion of said path, so that the marking member is supported along the second portion and thereby traverses the path substantially without interruption.

4,420,763

ELECTROMECHANICAL PRINTING DEVICE FOR A PRINTER OF THE SERIES-PARALLEL TYPE

Renaud Cuel; Henri Le Gledic, and Yvon Le Meur, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 18, 1982, Ser. No. 340,018
Claims priority, application France, Jan. 27, 1981, 81 01464
Int. Cl.³ G01D *15/24*
U.S. Cl. 346—139 R 1 Claim



1. An electromechanical printing device for a printer of the series-parallel type, comprising:
a printing head;
a roller supporting a sheet to be printed;
a rotary stepper motor;
first transmission means for transforming the rotary movement generated by the motor into a rotational movement of the roller about its axis, so as to cause said sheet to advance; and
second transmission means for transforming the rotary movement generated by said motor into a reciprocating rectilinear movement applied to the printing head, perpendicular to and synchronous with the movement of said sheet;
said second transmission means comprising an eccentric mounted on the shaft of the motor and placed in an aperture provided in the printing head;
said first transmission means comprising means coupled to said motor so as to transmit only one rotational step out of two and to transform it into a rotational movement applied to said roller, said last-mentioned means comprising:
an endless screw having a thread formed of several sectors alternately circular in shape and helical in shape, each sector corresponding to a step of the motor;
transmission means for transmitting the rotational movement of the motor to the endless screw; and
a gear wheel, meshing with said endless screw and coupled to said roller so as to impart thereto a rotational movement.

4,420,764

INK JET PRINTER HEAD

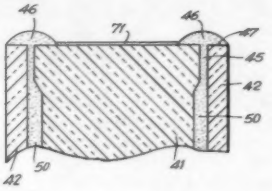
Junichi Okada, Shiojiri, Japan, assignor to Epson Corporation and Kabushiki Kaisha Suwa Seikosha, both of Tokyo, Japan

Filed Sep. 4, 1981, Ser. No. 299,470
Claims priority, application Japan, Sep. 8, 1980, 55-124259; Sep. 8, 1980, 55-124260; Sep. 8, 1980, 55-124261; Sep. 8, 1980, 55-124262; Sep. 8, 1980, 124263
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R 9 Claims

1. An ink jet printer head for ejecting ink droplets for printing on a recording medium, comprising;
a first substrate, said first substrate having a portion of a

front face formed thereon, said front face having a planar surface;

a pair of second substrates, said second substrates being positioned on opposite sides of said first substrate, and the end of each said second substrate being another portion of said front face, thickness of said second substrates being not more than half of that of said first substrate; a plurality of nozzles, each said nozzle having a discharge opening at said planar surface, said nozzles being arranged in two linear rows, droplets being ejected selectively through said nozzle discharge openings upon actuation or said ink jet printer head, said front face being subject to the formation of an ink layer thereon around said nozzle discharge openings,



an ink flow path connected to each said nozzle, said ink flow path including an ink supply portion and a pressure chamber, said ink flow path and said nozzle being formed between said first substrate and each said second substrate;

means for selectively pressurizing said ink in each said flow path, said selective pressurizing causing the ejection of a droplet from the associated nozzle; and

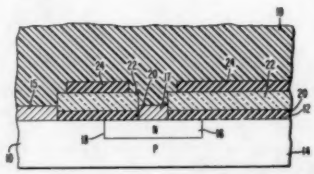
means for controlling the trajectories of said droplets ejected from said nozzles by providing a symmetry in said ink layer around said nozzle openings, said means for controlling the trajectories of said droplets being formed in said front face surface between said linear rows of nozzles, each said controlled trajectory being a linear extension of the respective longitudinal axis of the nozzle ejecting the droplet.

4,420,765

MULTI-LAYER PASSIVANT SYSTEM

Ming L. Tarng, Mercerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 29, 1981, Ser. No. 268,284
Int. Cl.³ H01L *29/34*
U.S. Cl. 357—54 **10 Claims**



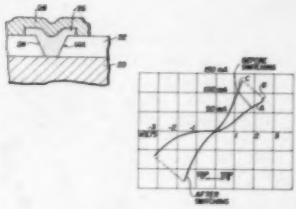
1. A semiconductor device comprising a body of semiconductor material having at least two regions of opposite conductivity type forming a PN junction therebetween, said PN junction terminating in a surface of said body, a first layer of semi-insulating material over said surface and covering said PN junction, a layer of dielectric material over said first semi-insulating layer and a second layer of semi-insulating material over said dielectric layer.

4,420,766

REVERSIBLY PROGRAMMABLE POLYCRYSTALLINE SILICON MEMORY ELEMENT

Alan J. Kasten, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Feb. 9, 1981, Ser. No. 232,520
Int. Cl.³ H01L *45/00*
U.S. Cl. 357—59 **3 Claims**



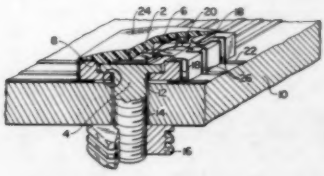
1. A reversibly programmable non-volatile memory element comprising a thin layer of polycrystalline silicon having an impurity concentration in the range of 10^{17} to 10^{20} atoms per cubic centimeter and a pair of electrode means connected to said thin layer for applying a voltage having a ramped trailing edge to switch said element from a high to a low resistance state and a voltage having a straight trailing edge to switch said element from a low to a high resistance state.

4,420,767

THERMALLY BALANCED LEADLESS MICROELECTRONIC CIRCUIT CHIP CARRIER

Robin H. Hodge, Menlo Park, and Mark A. Brodsky, Sunnyvale, both of Calif., assignors to Zilog, Inc., Calif.

Continuation of Ser. No. 959,345, Nov. 9, 1978, abandoned. This application Aug. 22, 1980, Ser. No. 181,159
Int. Cl.³ H01L *23/02*
U.S. Cl. 357—81 **24 Claims**



1. A heat sinking thermally balanced microelectronic circuit chip package, comprising:

a high thermal conductivity member serving as a base for attachment of the chip thereto and for conducting heat from said chip,

a heat conductive, thermal expansion stress relieving mounting material attaching said chip to said conductive member, and

a substantially rigid electrically insulative carrier member attached to said conductive member adjacent said chip, but without any substantial contact with the chip or mounting material, said carrier extending outward of said conductive member and including a plurality of electrically conductive leads carried thereby for allowing electrical connection between said chip and a receiving surface.

4,420,768
METHOD AND APPARATUS FOR THE DETECTION OF ACCUMULATIONS OF PARTICLES SUCH AS METAPHASE PLATES

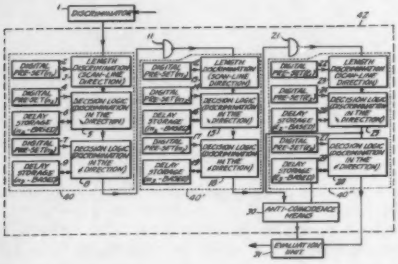
Rudolf Grosskopf, Konigsbronn, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Nov. 24, 1981, Ser. No. 324,586

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044883

Int. Cl.³ H04N 7/18

U.S. Cl. 358—107 **18 Claims**



1. A method of detecting accumulations of particles, for instance metaphase plates, in an image converted by a raster process into electrical signals in which the image is subdivided by a high-frequency signal into raster elements which have a fixed position with respect to each other in successive scanning lines and in which there are provided a discriminator for the selection of the objects to be evaluated in accordance with selectable criteria, an evaluation unit for the logical analysis and counting of the objects, delay storages for comparison of adjacent raster elements in successive scanning lines, said storages delaying the digital image signals fed by amounts of time which correspond to one raster element spacing and approximately one line length, and a decision logic in order to determine whether a structure element fits the object examined, characterized by the fact that an electronic image dilation is carried out in several directions, the parameters of the dilations being so selected that the images of the chromosomes of metaphase plates agglomerate to form uniform structures, and that thereupon an image erosion is effected in several directions the parameters of the erosion being so selected that images of cells disappear while images of the agglomerated metaphase plates, however, remain.

4,420,769
DEVICE FOR THE AUTOMATIC EDITING, AT THE RECEIVER, OF UNWANTED PROGRAM MATERIAL FROM BROADCAST ELECTRICAL SIGNALS

Albert P. Novak, 96 Cypress St., Floral Park, N.Y. 11101

Filed Mar. 22, 1978, Ser. No. 889,049

Int. Cl.³ H04M 7/02

U.S. Cl. 358—139 **31 Claims**

1. A system for the elimination of predetermined video/audio program information from broadcasted video/audio signals comprising, in combination:

a video/audio signal source;

a video/audio signal;

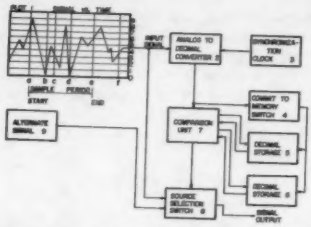
a video/audio signal output normally connected to said video/audio source;

a switch to disconnect said output from said source;

and switch operation means to cause blanking of unwanted video/audio signal information from said video/audio signal output by providing the operation of said switch correlative to the information contained within said video/audio signal and wherein said switch operation means includes a video/audio signal sampling/conversion means for sampling a content of the video/audio signal, and converting the video/audio signal samples into data bits representing digital words;

a memory means adapted to store digital words therein;

programming means for storing selected digital words within said memory means;



a comparator means for comparing the output of said video/audio signal sampling means with said memory to obtain an enabling output from said comparator means when said digital words generated by said video/audio signal sampling/conversion means match;

transmitting means for routing said enabling output to, and operating, said switch.

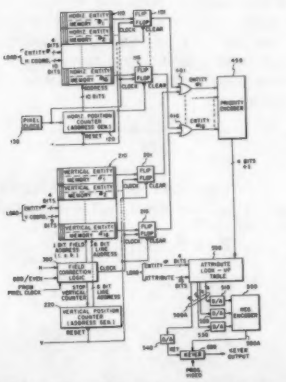
4,420,770
VIDEO BACKGROUND GENERATION SYSTEM

Atlaf Rahman, Stamford, Conn., assignor to Thomson-CSF Broadcast, Inc., Stamford, Conn.

Filed Apr. 5, 1982, Ser. No. 365,775

Int. Cl.³ H04N 5/22

U.S. Cl. 358—183 **10 Claims**



1. For use in conjunction with a video generating apparatus that includes means for producing vertical and horizontal synchronizing signals and clock signals, a system for producing video signals representative of video patterns having operator-selected video attributes, comprising:

a vertical bit memory including a plurality of vertical entity memories, each vertical entity memory having a memory bit for each line of a video frame;

a horizontal bit memory including a plurality of horizontal entity memories, each horizontal entity memory having a memory bit for each elemental horizontal reference position of a video frame;

a vertical address generator for counting scanlines of a video frame and generating vertical entity memory addresses used to access the vertical entity memories in parallel;

a horizontal address generator responsive to clock signals for generating horizontal entity memory addresses used to access the horizontal entity memories in parallel;

means for entering, in the horizontal entity memories and vertical entity memories, respectively, binary indications of operator-selected horizontal and vertical coordinates defining diagonally opposite corners of operator-selected video patterns for one or more operator-selected entities;

a plurality of vertical start/stop detectors, each being responsive to the output of a respective vertical entity memory;

a plurality of horizontal start/stop detectors, each being responsive to the output of a respective horizontal entity memory;

a plurality of coincidence detectors, one for each entity, each generating an output for its respective entity as a function of coincident outputs from the vertical and horizontal start/stop detectors for the entity;

a priority encoder responsive to the outputs of the coincidence detectors for generating an output designating the highest priority entity that is on at a given time; and

an entity attribute look-up memory which is responsive to the output of said priority encoder to generate output video-representative signals having attributes that were previously stored in said attribute look-up memory in conjunction with each entity.

4,420,771

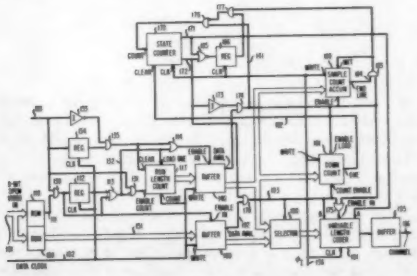
TECHNIQUE FOR ENCODING MULTI-LEVEL SIGNALS

Peter Pirsch, Hanover, Fed. Rep. of Germany, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1981, Ser. No. 232,701

Int. Cl.³ H04L *3/00*; H04N *7/12*

U.S. Cl. 358—261 **17 Claims**



1. Apparatus for compressing samples of a multilevel communication signal, each sample having one of at least M ($M \geq 3$) different values, wherein the statistical likelihood of occurrence of a particular one of said values is much greater than the statistical likelihood of occurrence of any other of said values, including

means for grouping said samples in runs of a first or a second type, wherein said first type runs include one or more samples of said particular value and said second type runs include one or more samples of said other values, and

means for encoding the lengths of said runs and a representation of said other values.

4,420,772

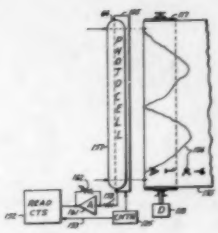
ILLUMINATION AND LIGHT GATE UTILIZATION METHODS AND APPARATUS

John H. Jacobs, Altadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 24,486, Mar. 27, 1979, Pat. No. 4,316,196, which is a division of Ser. No. 925,132, Jul. 17, 1978, abandoned, which is a continuation of Ser. No. 776,157, Mar. 10, 1977, abandoned. This application Jul. 20, 1981, Ser. No. 284,751

Int. Cl.³ H04N *1/12*

U.S. Cl. 358—294 **4 Claims**



1. In a method of reading information from a record with the aid of a plurality of electrically controlled light gates, the improvement comprising in combination the steps of:

illuminating said light gates with light of a first intensity above zero light intensity;

preconditioning said light gates to subsequent opening in response to electric control signals by electrically biasing said light gates to an initially open condition wherein said gates pass light from said illumination at an intensity above zero light intensity and below a second intensity lower than said first intensity;

subjecting said record to a first illumination by said light of an intensity above zero light intensity and below said second intensity as passed by said preconditioned gates in said initially open condition;

subjecting said record to a second illumination by further opening said preconditioned light gates in response to electric control signals to pass light at at least said second light intensity and scanning said record with said passed light at at least said second intensity; and

reading information from said record only in response to said second illumination as among said first and second illuminations.

4,420,773

ELECTRONIC PHOTOGRAPHIC CAMERA

Kenji Toyoda, Chigasaki; Takao Watanabe, Koshigaya; Hideya Inoue, Kawasaki; Atsumi Kasuya, Tokyo; Yutaka Ichihara, Yokohama, and Akira Miyaji, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 18, 1981, Ser. No. 275,403

Claims priority, application Japan, Jun. 30, 1980, 55-89506; Jul. 4, 1980, 55-91275; Jul. 7, 1980, 55-92350; Sep. 25, 1980, 55-133539; Nov. 29, 1980, 55-168170

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—335 **46 Claims**

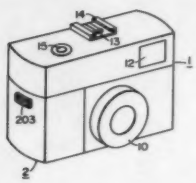
1. An electronic photographic camera comprising:

(a) an optical system forming an image of an object to be photographed;

(b) a solid state imaging sensing device including a plurality of light-receiving elements disposed in the imaging plane of said optical system and producing a charge corresponding to the quantity of incident light and accumulating the charge therein, first and second gate means for transferring the charge accumulated in said elements respectively, register means for putting out the charge transferred by the opening of said first gate means successively in time-

series fashion correspondingly to each of said elements, and drain means for receiving the charge accumulated in said elements beyond a predetermined amount during the closing of said second gate means and receiving the charge produced in said elements during the opening of said second gate means;

(c) first and second gate control means for executing in a time sequential order a first control where said first gate



means is closed and also said second gate means is opened, a second control where both said first and second gate means are closed for a perdetermined period and a third control where said first gate means is opened and also said second gate means is closed; and

(d) means for metering the brightness of said object by the amount of charge drained from said drain means through said second gate means which is opened by said first control of said control means.

4,420,774

FM DATA RECORDING AND PLAYBACK METHOD AND APPARATUS

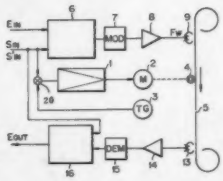
Hiroshi Sato, Fujisawa, Japan, assignor to Daiichi Electric Co., Ltd., Fujisawa, Japan

Continuation-in-part of Ser. No. 212,221, Dec. 2, 1980, abandoned. This application Mar. 29, 1983, Ser. No. 479,975

Claims priority, application Japan, Dec. 26, 1979, 54-168268

Int. Cl.³ G11B *5/00, 5/02*

U.S. Cl. 360—28 **5 Claims**



1. An FM data recorder, comprising:

(A) a recording means comprising:

(a) a recording operational amplifier having two inputs, the first input having a data signal from a miniature test model under test, and the second input having a recording speed control signal, said signals being operated on by said operational amplifier;

(b) a modulator, the input of which is connected to said recording operational amplifier, said operated signals modulating a frequency of the carrier wave in said modulator;

(c) a write amplifier, the input of which is connected to said modulator, said operated modulated carrier wave being amplified by said write amplifier;

(d) and a write means, the input of which is connected to said write amplifier, said amplified modulated carrier wave being written by said write means onto a record medium;

(B) a playback means comprising:

(a) a read means which reproduces the recorded modulated carrier wave from said record medium;

(b) a read amplifier, the input of which is connected to said read means, said reproduced modulated carrier wave being amplified by said read amplifier;

(c) a demodulator, the input of which is connected to said read amplifier, said amplified modulated carrier wave being demodulated into a data and recording speed control signal based on a playback speed;

(d) and a playback operational amplifier, the input of which is connected to said demodulator, said playback operational amplifier operating on said demodulated carrier wave which is said data and recording control signal, and a speed control signal based on a playback speed control signal, said playback operational amplifier outputting only the desired data signal:

(C) a speed control means which controls a recording speed and a playback speed by two different speed control signals which have a variable speed ratio between the recording speed and the playback speed, whereby said variable speed ratio is directly proportional to the size ratio between said miniature test model size and an actual physical size of a structure.

4,420,775

CIRCUIT AND METHOD FOR PROTECTING A HORIZONTAL SYNCHRONOUS SIGNAL

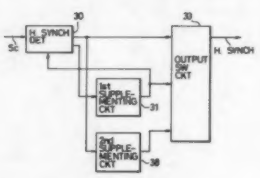
Shigeru Yamazaki; Takao Arai; Masaharu Kobayashi, all of Yokohama; Takashi Hoshino, Fujisawa; Chitoshi Hibino, and Harukuni Kobari, both of Yokohama, all of Japan, assignors to Nippon Victor Kabushiki Kaisha, Yokohama and Hitachi, Ltd., Tokyo, both of, Japan

Filed Sep. 25, 1981, Ser. No. 305,779

Claims priority, application Japan, Sep. 26, 1980, 55-132876; Sep. 26, 1980, 55-133830

Int. Cl.³ G11B *27/10, 5/43*

U.S. Cl. 360—38.1 **6 Claims**



5. A method of protecting a horizontal synchronous signal of a pulse code modulated signal derived from a recording medium, which signal has been recorded in the form of a standard television signal with an interleaving technique by converting an analog signal into a pulse code modulated signal and by mixing the pulse code modulated signal with a synchronous signal based on a scanning standard of the standard television system, said method including a step of adding first and second supplementary horizontal synchronous pulses in such a manner that the first supplementary horizontal synchronous pulse is added when a horizontal pulse of the synchronous signal is not detected, and the second supplementary horizontal pulses are added when horizontal pulses of the synchronous signal are not detected continuously, said method comprising the steps of:

(a) determining whether the interval between adjacent horizontal synchronous pulses of said synchronous signal at the time of returning from a condition that horizontal synchronous pulses are added to a condition of synchronizing with the horizontal synchronous pulses of the synchronous signal is longer or shorter than a predetermined value and;

(b) removing an initial pulse of said second supplementary pulses, which initial pulse appears at the time of returning

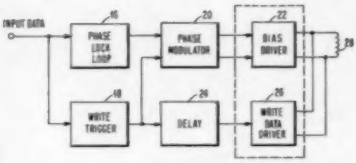
to said condition, the initial pulse being removed in response to the results of the determining step when said initial pulse occurs within a predetermined time interval.

4,420,776

PSK MODULATION IN AC BIAS DATA RECORDING

Stephen A. Jove, San Jose, and Julian E. Vaughn, Campbell, both of Calif., assignors to International Business Machines, Armonk, N.Y.

Filed Nov. 30, 1981, Ser. No. 325,711
Int. Cl.³ G11B 5/09
U.S. Cl. 360—45 6 Claims



1. An apparatus for recording a high frequency data signal having first and second signal processing channels, said first channel comprising a phase lock loop for receiving high frequency input data signals and for providing an AC bias signal having a frequency that is a multiple of the frequency of said data signal, wherein the ratio of said frequencies is no greater than 10:1; and

a phase modulator coupled to the output of said phase lock loop for modulating the phase of said AC bias signal;

said second channel comprising a write trigger circuit for dividing said data frequency; and

driver means coupled to said phase modulator and said write trigger; and

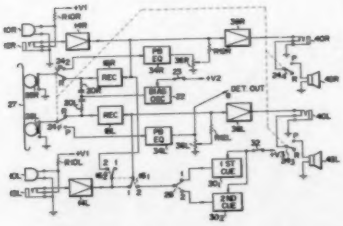
a magnetic head coupled to the output of said driver means for receiving the combined data and bias signals, wherein said data and bias signals are phase locked such that bit shift error is eliminated.

4,420,777

TAPE RECORDER WITH CUE PROCESSOR

Kenji Furuta, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1981, Ser. No. 302,232
Claims priority, application Japan, Sep. 22, 1980, 55-132187
Int. Cl.³ G11B 15/12
U.S. Cl. 360—61 6 Claims



1. A tape recorder with a cue signal processor, comprising:

first means for providing a first recording signal;

second means for providing a second recording signal;

third means for providing a predetermined cue signal;

fourth means connected to said first means and said third means, for selecting said first recording signal or said cue signal to provide a selected signal;

fifth means connected to said second means and said fourth means and including means for recording signals on a first recording channel and a second recording channel, for recording said selected signal on said first recording channel and for recording said second recording signal on said second recording channel; and

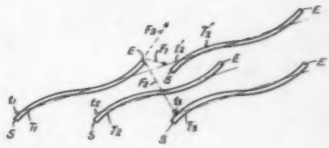
sixth means connected to said fifth means, for detecting said cue signal from said first recording channel.

4,420,778

HEAD TRACKING CONTROL SYSTEM FOR A HELICAL SCAN VTR

Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 23, 1981, Ser. No. 286,267
Claims priority, application Japan, Jul. 23, 1980, 55-100816
Int. Cl.³ G11B 21/10, 21/04; H04N 5/78
U.S. Cl. 360—77 15 Claims



1. Apparatus for reproducing information signals recorded in successive parallel tracks on a record medium comprising:

transducer means adapted for movement along each of the tracks in a scanning path from a beginning end to a concluding end thereof for reproducing the signals recorded therein;

transducer deflecting means for deflecting said transducer means in a direction transverse to the direction along the tracks;

polarity detecting means for detecting the direction of any deviation between the scanning trace of said transducer means and the track then being scanned thereby at the beginning end of said scanned track; and

updating means for producing and storing a control signal in response to said polarity detecting means and for supplying said control signal to said transducer deflecting means so as to control the latter to deflect said transducer means to accurately scan the beginning ends of said tracks, said updating means being controlled by said polarity detecting means to change the value of said stored control signal by an incremental amount in accordance with the detected direction of said deviation.

4,420,779

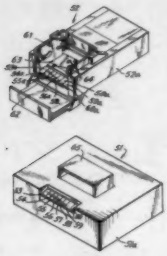
AUTOMATIC CASSETTE CHANGER

Yoshikazu Takano; Tomohisa Kamimura, and Mitsunobu Fujikawa, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 279,732, Jul. 2, 1981, abandoned. This application Aug. 14, 1981, Ser. No. 292,912
Claims priority, application Japan, Jul. 2, 1980, 55-90176
Int. Cl.³ G11B 15/68, 23/04
U.S. Cl. 360—92 22 Claims

1. An automatic cassette changer having a plurality of operating modes for automatically changing cassettes; comprising mode selecting means actuable for selecting said operating modes of the changer, a first motor for driving said mode

selecting means, actuator means adapted to be driven for causing operation of the changer in a selected one of said operating



modes determined by said mode selecting means, and a second motor for driving said actuator means.

4,420,780

SELF-LOADING MAGNETIC HEAD AIR BEARING SLIDER

Kenneth L. Deckert, San Jose, Calif., assignor to International Business Machines, Armonk, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,813
Int. Cl.[3] G11B *5/60, 17/32*
U.S. Cl. 360—103 8 Claims

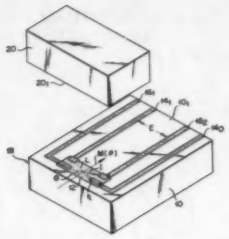
1. A self-loading magnetic head slider assembly comprising:
a support structure having leading and trailing ends and a front section extending across the support structure from the leading end thereof;
side rails disposed longitudinally from the front section to the trailing end along the side edges of a surface of said support structure;
a recessed section formed between said side rails behind said front section;
at least one magnetic transducer deposited at the trailing end of one of said side rails;
characterized in that said side rails and said front section have a continuously curved convex shape in longitudinal section between said leading and said trailing end; and
said continuously curved convex shape of said front section and said side rails and said recessed section produce a combined pressure profile when said slider assembly is positioned adjacent a moving magnetic medium so that said slider assembly assumes an orientation with respect to said moving magnetic medium in which the minimum spacing between said slider assembly and said magnetic medium occurs at the trailing end of said slider assembly.

4,420,781

MAGNETIC HEAD WITH AN AMORPHOUS HALL ELEMENT

Yoshifumi Sakurai, Minoo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1981, Ser. No. 276,458
Claims priority, application Japan, Jul. 7, 1980, 55-92481
Int. Cl.[3] G11B *5/38, 5/22*
U.S. Cl. 360—112 22 Claims



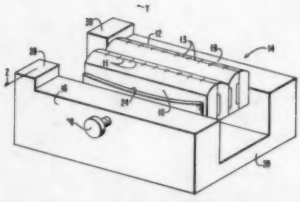
1. A magnetic head which comprises:
a support member having a plane to be faced by a magnetic recording medium; and
an amorphous magnetic film which has an axis of easy magnetization along the plane thereof and being arranged on said support member such that a magnetic flux (ϕ) sent forth from said magnetic recording medium passes through said amorphous magnetic film along said axis of easy magnetization, said amorphous magnetic film being so biased by a bias current that a first angle (θ) defined by the direction of said axis of easy magnetization and the running direction of said bias current is larger than 0° and smaller than 90°.

4,420,782

THERMAL COMPENSATION FOR MAGNETIC HEAD ASSEMBLY

Armando J. Argumedo; William W. Chow, both of Tucson, Ariz.; Robert D. Freeman, Roy, and Stawomir P. Kleczkowski, Ogden, both of Utah, assignors to International Business Machines, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 278,956
Int. Cl.[3] G11B *5/10*
U.S. Cl. 360—129 9 Claims



1. A magnetic head assembly comprising:
an integral one piece housing two opposing walls, made of nonmagnetic material;
head module means formed of a magnetic material positioned within said housing;
said magnetic and nonmagnetic materials having different coefficients of thermal expansion;
nonmagnetic leaf spring means disposed between one wall of said housing and said head module means for clamping said module means to an opposing wall of said housing

and for providing thermal compensation to said module means; and

adjusting means to provide adjustment of the clamping force of said leaf spring means to a predetermined value.

4,420,783

MODE SELECTOR ASSEMBLY FOR USE IN TAPE RECORDERS

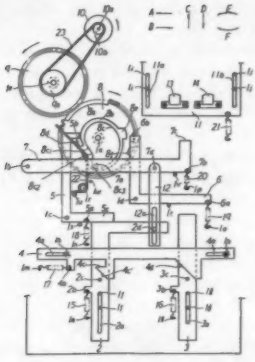
Takahiko Suezawa; Satoru Koizumi; Hiroaki Nakao, and Takashi Tsuchitani, all of Higashihiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 7, 1981, Ser. No. 281,129

Claims priority, application Japan, Jul. 7, 1980, 55-96108[U]

Int. Cl.³ G11B *15/18, 19/02*

U.S. Cl. 360—137 **3 Claims**



1. A mode selector assembly for use in a tape recorder for placing the tape recorder into a selected operating mode by means of a rotating member, upon the actuation of an actuator lever, said mode selector assembly comprising

a rotating member having a cam surface,

interlocking means provided between the actuator lever and the rotating member for achieving a sliding movement with the rotational movement of the cam surface, responsive to rotation of the rotating member and

connecting means for connecting the actuator lever to the interlocking means,

wherein upon the actuation of the actuator lever, the rotating member is rotated, and the actuator lever is shifted to its actuated position via the interlocking means, in response to the rotation of the cam surface.

4,420,784

HYBRID D.C. POWER CONTROLLER

C. Gregory Chen, Brown Deer; Ping S. Lee, Milwaukee; Peter J. Theisen, West Bend, and Slobodan Krstic, Milwaukee, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 4, 1981, Ser. No. 327,388

Int. Cl.³ H01H *33/14*

U.S. Cl. 361—7 **19 Claims**

1. A D.C. power controller for effectively interrupting a high voltage high current D.C. power line supplying a load from a D.C. power supply source comprising:

power contacts in said power line;

operating means for said power contacts;

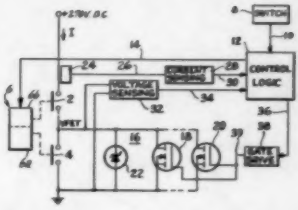
arc control means associated with said power contacts; and control means comprising:

a plurality of arc-shunting solid state elements connected in parallel across said power contacts;

means for controlling said operating means to open said power contacts;

means for sampling the power line current and the voltage across said open contacts to determine when said current has decreased to a value that can be conducted by said solid state elements and said voltage has increased to a value capable of effecting transfer of the arcing current from said power contacts to said solid state elements;

means for allowing said power contacts to arc until said values of current and voltage are reached;



and means thereupon operable to gate said solid state elements to divert the arcing current from said contacts thereby to afford effective and repeated interruption of said power line by use of a minimum number of said solid state elements in combination with said power contacts for power interruption control.

4,420,785

OVERVOLTAGE PROTECTION CIRCUIT FOR LINE AMPLIFIERS

Friedrich-Christian Tischer; Horst Kleinmann, and Herwig Klinger, all of Backnang, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 17, 1981, Ser. No. 274,443

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 3022677

Int. Cl.³ H02H *3/20*

U.S. Cl. 361—56 **7 Claims**

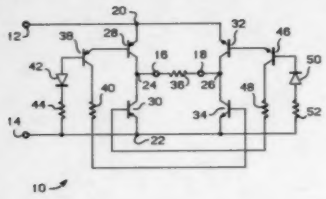
1. In an overvoltage protection circuit for an amplifier having signal input means and signal output means and being inserted in series between lengths of a signal transmission line, the line including a ground path and the amplifier being supplied with operating power via the transmission line and including power supply inputs conductively connected to the transmission line lengths via a current supply filter, the improvement comprising: an overvoltage arrester for providing coarse overvoltage protection connected between said ground path and a point located between one said line length and one of said power supply inputs; and two lowpass filters which form part of said current supply filter each connected between said arrester and a respective one of said transmission line lengths so that high frequency, high energy pulses which are generated if said arrester is fired cannot reach either the signal input or signal output means.

4,420,786

POLARITY GUARD CIRCUIT

John J. Toney, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 16, 1981, Ser. No. 322,055
Int. Cl.³ H02H 7/20
U.S. Cl. 361—77 3 Claims



1. A polarity guard circuit for providing an output voltage having a positive polarity regardless of the polarity of an input voltage, said circuit comprising:

a first and a second input terminal receiving said input voltage;

a first and a second output terminal;

a first transistor having a base, collector and emitter, coupled between said first input terminal and said first output terminal;

a second transistor having a base, collector and emitter, coupled between said first input terminal and said second output terminal;

a third transistor having a base, collector and emitter, coupled between said second input terminal and said first output terminal;

a fourth transistor having a base, collector and emitter, coupled between said second input terminal and said second output terminal;

a fifth transistor having a base, collector and emitter, coupled between the bases of said first transistor and said fourth transistor, the base of said fifth transistor coupled to one of said input terminals; and

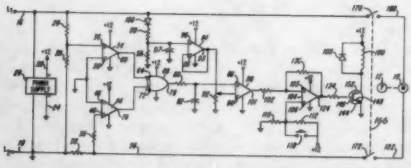
a sixth transistor having a base, collector and emitter, coupled between the bases of said second transistor and said third transistor, the base of said sixth transistor coupled to one of said input terminals.

4,420,787

WATER PUMP PROTECTOR

John L. Tibbits, Centerville; Lamar D. Springer, Spring Valley, and John W. Sellers, Jr., Xenia, all of Ohio, assignors to Spring Valley Associates Inc., Centerville, Ohio

Filed Dec. 3, 1981, Ser. No. 327,269
Int. Cl.³ H02H 3/26
U.S. Cl. 361—79 6 Claims



1. Protective circuitry for a liquid pump which is operated by an electric motor which is connected to a source of alternating current energy through a pair of electric conductors and switch means, comprising:

voltage divider means joined to the electric conductors,

a first operational amplifier, the first operational amplifier having a pair of input terminals and an output terminal,

means joining the input terminals of the first operational amplifier to the voltage divider means to provide a voltage representing the voltage between the electric conductors and in phase therewith,

a second operational amplifier, the second operational amplifier having a pair of input terminals and an output terminal,

means joining the input terminals of the second operational amplifier to at least one of the electric conductors to provide voltage representing the current flow through the electric conductor and in phase with the current flow through the electric conductor,

an exclusive-OR-gate provided with a pair of input terminals and an output terminal,

means joining the output terminals of the operational amplifiers to the input terminals of the exclusive-OR-gate,

a third operational amplifier, the third operational amplifier being provided with a pair of input terminals and an output terminal,

means joining the output terminal of the exclusive-OR-gate to one of the input terminals of the third operational amplifier,

means joining the other input terminal of the third operational amplifier to one of the electric conductors,

a fourth operational amplifier, the fourth operational amplifier having a pair of input terminals and an output terminal,

means joining the output terminal of the third operational amplifier to one of the input terminals of the fourth operational amplifier, and means joining said one input terminal of the fourth operational amplifier to the output terminal thereof,

means joining the other input terminal of the fourth operational amplifier to a source of direct current voltage,

a transistor provided with a base, a collector and an emitter,

means joining the output terminal of the fourth operational amplifier to the base of the transistor,

an electrical actuator member for operation of the switch means,

means joining the collector of the transistor to the electrical actuator member,

means joining the emitter of the transistor to a source of direct current voltage,

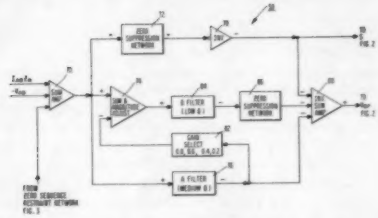
the first and second operational amplifiers providing representative voltages to the exclusive-OR-gate in accordance with the voltage applied to the electric conductors and the current through said one conductor, the exclusive-OR-gate detecting the time sequence between said voltage at the output terminal of the first operational amplifier with respect to the voltage at the output terminal of the second operational amplifier, the exclusive-OR-gate emitting an average output voltage in accordance with the total time period that both of the operational amplifiers are emitting a voltage, the third operational amplifier emitting an output voltage when the average output voltage of the exclusive-OR-gate exceeds a given magnitude, the fourth operational amplifier emitting an output current to the base of the transistor when the output voltage of the third operational amplifier exceeds a given magnitude, the transistor emitting a current sufficient to energize the electric actuator member, the electric actuator member thus operating the switch means to deenergize the electric motor to protect the pump which is operated by the electric motor.

4,420,788

PHASE RELAY FOR AC POWER TRANSMISSION LINE PROTECTION

Stanley B. Wilkinson, Havertown, and George E. Alexander, Wallingford, both of Pa., assignors to General Electric Company, King of Prussia, Pa.

Filed Jul. 29, 1982, Ser. No. 403,273
Int. Cl.³ H02H 3/26, 7/26
U.S. Cl. 361—85 20 Claims



1. In a protective relay for detecting faults in a three-phase AC power system, the relay being of a phase angle comparator type and including phase coincidence detecting means responsive to at least two input signals supplied thereto, one input signal being an operating signal and a second input signal being a polarizing signal, and timer circuit means responsive to an output signal from said phase coincidence detecting means when the phase coincidence of the input signals is of a predetermined duration, means for developing said operating signal upon detection of a fault by summing the following signals:

a. a pre-fault signal comprising the pre-fault value of a first difference signal which is related to the difference between (1) the product of a signal proportional to a transmission line current and a replica impedance of the transmission line and (2) a signal proportional to a transmission line voltage; and

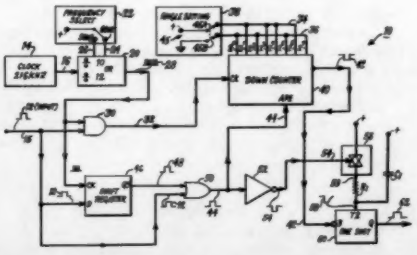
b. that portion of a second difference signal which exceeds a predetermined threshold value, the second difference signal being related to the difference between (1) said first difference signal and (2) a preselected portion of the magnitude of said pre-fault signal.

4,420,789

CHARACTERISTIC TIMER FOR A PROTECTIVE RELAY

Thomas B. Breen, Lansdowne, Pa., assignor to General Electric Company, King of Prussia, Pa.

Filed Apr. 19, 1982, Ser. No. 369,440
Int. Cl.³ H02H 3/093
U.S. Cl. 361—94 4 Claims



1. A characteristic timer for a protective relay that measures the time duration of an applied signal which is representative of a normal or abnormal condition of a portion of a transmission line associated with said protective relay, said characteristic timer measuring the time duration of the applied signal relative to the frequency of the power source supplying said transmission line, said characteristic timer comprising:

(a) means including a clock source for developing a first output signal having a frequency proportional to the frequency of said power source;

(b) means responsive to coincidence between the applied signal and the first output signal for generating a second output signal having a frequency equal to the frequency of the first output signal when there is coincidence between said applied signal and said first output signal;

(c) selectable means for selecting a first digital signal representative of a desired angle within the range of 0 to 180 degrees of one cycle of the frequency of said power source;

(d) means for developing a third output signal in response to the occurrence of a hole in said applied signal having a duration less than a predetermined amount;

(e) a digital counter for receiving said second and third output signals and said first digital signal and having:

(1) an initial digital content established in response to said first digital signal,

(2) a digital content that is altered in response to said second output signal,

(3) a digital content that is unconditionally resettable to its initial digital content in response to the absence following the presence of said third output signal, and

(4) means for generating a fourth output signal upon the occurrence of its digital content being altered to a predetermined quantity; and,

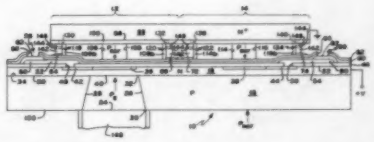
(f) means responsive to the fourth output signal for developing a fifth output signal that extends past termination of said fourth output signal.

4,420,790

HIGH SENSITIVITY VARIABLE CAPACITANCE TRANSDUCER

Keith W. Golke; Thomas E. Hendrickson, and Charles C. Huang, all of Hennepin County, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 2, 1982, Ser. No. 365,071
Int. Cl.³ H01G 7/00; G01L 9/12
U.S. Cl. 361—283 39 Claims



1. A semiconductor device, comprising:

a sensor transducer having a first portion adapted to deform upon application of forces due to first and second phenomena so that a first capacitance will vary in response to forces applied to the first portion due to both phenomena; and

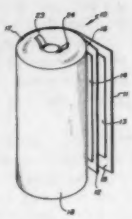
a reference transducer having a second portion adapted to deform upon application of forces due to the first phenomenon and the second portion being further adapted to remain substantially undeformed upon application of forces due to the second phenomenon, so that a second capacitance will vary in response to forces applied to the second portion due to the first phenomenon but will not vary in response to forces applied to the second portion due to the second phenomenon, and therefore variations of the first capacitance due to the first phenomenon can be distinguished from variations of the first capacitance due to the second phenomenon by comparing the variations of the first and second capacitances or electrical signals related thereto.

4,420,791

DIELECTRIC FLUID

Vandos Shedigian, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Dec. 28, 1981, Ser. No. 334,529
Int. Cl.³ H01G 4/22
U.S. Cl. 361—319 **5 Claims**



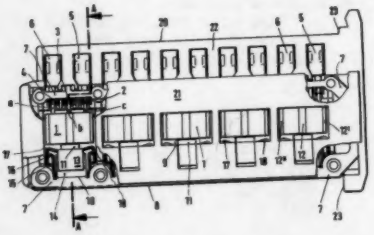
1. A dielectric fluid comprising a mixture of about 70% by volume of a diarylethane compound and about 30% by volume of an epoxide additive effective to improve the dielectric constant of the fluid.

4,420,792

PLUG-IN CONNECTOR WITH ARRESTERS FOR SEPARATING BLOCKS

Gunter Hegner, and Hermann Herfort, both of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,046
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113759
Int. Cl.³ H02B 1/10
U.S. Cl. 361—331 **12 Claims**



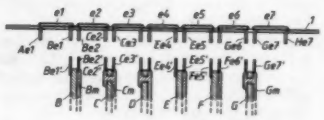
1. A plug-in connector with a plurality of arresters for separating blocks, said connector comprising:
- a cartridge-type housing made of insulating material, said housing being elongated and formed with a like plurality of said openings therethrough, said openings being adjacent one another in linear spaced arrangement;
- a group of three friction-type electrical clamping contacts adjacent each said side opening in said housing;
- a U-shaped earth strip substantially longitudinally coextensive with said housing, one longitudinal side of said earth strip comprising an earth bar positioned along one edge of said housing, the opposite longitudinal side of said earth strip being positioned on the opposite side of said side openings whereby said side openings are positioned within the open part of the U of said earth strip;
- a plurality of externally accessible tapping contacts in spaced adjacent relationship along the opposite longitudinal edge of said housing, two of said clamping contacts in each group being connected individually to two of said tapping contacts adjacent thereto, another one of said clamping contacts in each group being connected to said earth strip;
- three spaced electrodes formed on each said arrester;
- a contact pin extending from each said arrester electrode, all three said contact pins being in spaced substantially parallel relationship;
- said contact pins of one said arrester being pluggably and removably received by said clamping contacts in each said group, said arrester being removably externally accessible through said side openings, first and second ones of said electrodes being connected to respective said tapping contacts;
- a compression spring assembly removably mounted between each said arrester and said earth bar;
- a meltably fuse element positioned between said spring assembly and the third electrode of said arrester;
- said spring assembly normally making electrical and mechanical contact between said earth bar and said third electrode through said fuse element and constantly biasing said arrester toward the plugged position, said third electrode being further connected to said earth strip by means of one of said contact pins said another one of said clamping contacts when said arrester is in the plugged position; and
- a pair of electrical contacts fixed on opposite sides of said spring assembly and normally spaced from said first and second electrodes respectively.

4,420,793

ELECTRICAL EQUIPMENT

Lars Strandberg, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Sep. 21, 1981, Ser. No. 304,441
Claims priority, application Sweden, Sep. 29, 1980, 8006798
Int. Cl.³ H05K 1/14
U.S. Cl. 361—413 **5 Claims**



1. Electrical equipment comprising:
- a connection device including a plurality of mating contact devices, each of which receives a circuit card contact device, said connection device including a plurality of conductors, each beginning at one of said mating contact devices and ending at another of said mating contacting devices; and
- a plurality of electronic functional units, each unit including a main circuit card and at least one slave circuit card, all of said circuit cards including a contact device inserted in said mating contact device providing a plurality of electrical connections to a respective circuit card, said slave circuit card including a contact bridge means for connecting one of said plurality of conductors to another of said conductors through said circuit card connection device and a respective mating connection device, whereby a functional unit is formed between a slave card and a main circuit card having a local bus formed by said plurality of conductors isolated from other functional units.

4,420,794

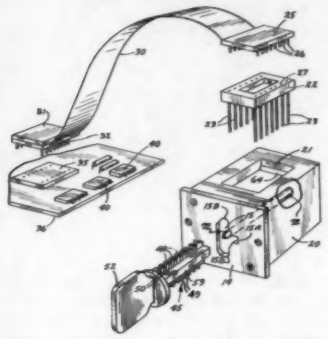
INTEGRATED CIRCUIT SWITCH

James R. Anderson, Minneapolis, Minn., assignor to Research, Incorporated, Eden Prairie, Minn.

Filed Sep. 10, 1981, Ser. No. 300,965
Int. Cl.³ H05F 5/100
U.S. Cl. 361—419 **10 Claims**

1. An integrated circuit switch comprising a housing having

an opening therein, means in said housing for providing a plurality of individual first electrical contacts arranged in a pair of spaced rows of first contacts, a key assembly including a key base having a platform portion with an external surface forming a support and external side edge portions having grooves defined therein and spaced to correspond to the spacing of the first contacts in the respective rows, a dual in-line package supported on the external surface and having an electrical circuit coupled to elongated second circuit contacts which form the standard elongated leads of such dual in-line package extending externally from the opposite edges of the dual in-line package and which correspond in spacing to the first contacts in the housing, the key base having means on the platform for positioning the dual in-line package at a desired



location with the second circuit contacts along the opposite edge portions of the platform, the second circuit contacts being bent over the edge portions and each fitting into one groove, and being exposed along the edge portions, said key assembly fitting through said opening and being positioned between the rows of first contacts and being rotatable when inserted into the interior of said housing to bring the portions of the second circuit contacts of the dual in-line package carried by the key assembly and exposed at said edge portions into electrical connection withe corresponding first contacts in the housing, the rows of first contacts yielding resiliently as the key assembly is rotated and the exposed portions of the second circuit contacts are brought into electrical connection with the first contacts.

4,420,795

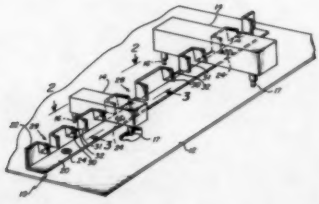
ELECTRONIC COMPONENT MOUNTING

Donald T. Scholz, 13 Rich Valley Rd., Wayland, Mass. 01778

Filed Aug. 17, 1981, Ser. No. 293,361

Int. Cl.³ H05K 7/12

U.S. Cl. 361—427 **7 Claims**



1. A mounting apparatus positioning and mounting electronic components such as high wattage resistors to a substrate board and comprising an elongated bracket having two elongated legs, means securing one of the legs to the substrate board including means for positioning the bracket intermediate predetermined points of attachment of the electronic components, the other of the legs extending substantially normal to the substrate board and having spacedly disposed and integral therewith a plurality of pairs of cut-out ears, each pair of ears extending substantially normal to said other leg and defining an aperture in the leg which receives a respective electronic component, said electronic components extending substantially orthogonally to the length of the bracket and said predetermined points of attachment including a terminal extending at least one on each side of the bracket, said ears being positioned to form an aperture width dimensioned relative to the component width to assure a force-fit of the component into the aperture.

4,420,796

DEVICE FOR DISPERSING LIGHT RAYS ISSUING FROM A LIGHT GUIDE

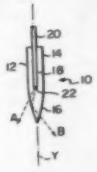
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Feb. 18, 1982, Ser. No. 350,058

Claims priority, application Japan, Feb. 24, 1981, 56-26291

Int. Cl.³ F21V 7/04

U.S. Cl. 362—32 **4 Claims**



1. A device for dispersing light rays issuing from a light guide, which comprises: an elongated body of a rigid transparent material, said body having adjacent an end thereof a central opening for receiving therein an end of a light guide in a light transmitting relationship, the other end of said body being tapered to define a peripheral surface tapering toward a point located in alignment with the axis of the body remote from said opening, said peripheral surface is curved toward said tapered end, so that the angle formed between the axis of the body and the line tangential to said surface in a plane of said axis gradually increases toward said tapered end, so that those light rays, entering from said light guide into said body at a small angle of intersection with respect to the axis of the body, are reflected back into the body at least one time by the internal boundary of said peripheral surface, thereby to propogate through said body at a larger angle of intersection with respect to said axis, whereby light rays issuing from the light guide, are dispersed as they leave said body.

4,420,797

REAR LAMP CONSTRUCTION OF A HATCHBACK TYPE MOTOR VEHICLE

Toru Tohata, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 6, 1981, Ser. No. 319,056

Claims priority, application Japan, Dec. 9, 1980, 55-177291[U]

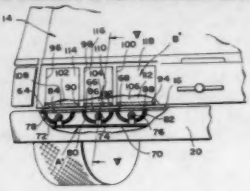
Int. Cl.³ B60Q 1/26, 1/44

U.S. Cl. 362—80 **10 Claims**

1. A rear lamp construction of a motor vehicle of a type having a hatchback door which is swingable relative to the vehicle body to open and close a door opening defined in a rear panel construction of the vehicle, said rear lamp construction comprising:

a first device mounted in said rear panel construction and

including a first electric bulb which, when energized, produces light which is directed toward the door opening; and a second device mounted in said hatchback door at a portion



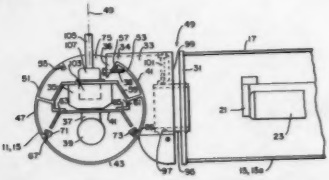
where the light coming from said first device reaches when the door is in its closed position, said second device including a first light reflecting mirror for reflecting rearward of the vehicle the light coming from said first device.

4,420,798

ADJUSTABLE OVERHEAD LIGHTING SYSTEM

Douglas J. Herst, Ross, and Henry H. Iwahashi, El Cerrito, both of Calif., assignors to Herst Lighting Co., Berkeley, Calif.

Filed Dec. 7, 1981, Ser. No. 328,106
Int. Cl.³ F21S *1/02*
U.S. Cl. 362—147 **21 Claims**



1. An adjustable overhead lighting system comprising
a set of elongated support runners of a uniform cross-sectional shape suspended overhead in spaced parallel relation with other support runners, said set of support runners having electrical source means,
a plurality of elongated hanger fixture elements, each hanger fixture element having an elongated lamp housing and end cap means projecting from the ends of said lamp housing, said end cap means being formed to releasably endwise engage the sides of said support runners along the length thereof whereby said hanger fixture element can be supported between adjacent parallel support runners substantially anywhere along the length of said support runners,
said hanger fixture elements having electrical means including electrical path means for electrifying the lamps in said hanger fixture element lamp housing from the electrical source means of said support runners, when said hanger fixture elements are positioned on said support runners.

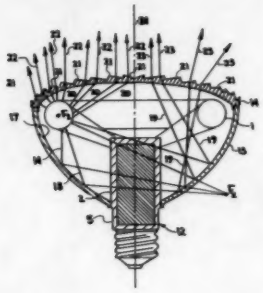
4,420,799

CIRCULAR GAS DISCHARGE REFLECTOR LAMP

Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024

Filed Aug. 20, 1982, Ser. No. 409,999
Int. Cl.³ F21S *5/00*
U.S. Cl. 362—216 **8 Claims**

1. A circular gas discharge reflector lamp comprising:
a ballast housing supporting and at least partially enclosing a current controlling ballast and having proximal and distal ends;
a generally tubular member extending from the proximal end of the ballast housing and terminating in a male screw shell;
a plurality of lamp engaging arms extending from the ballast housing and adapted to retain a circular gas discharge lamp;
a circular gas discharge lamp retained by the lamp engaging arm and disposed coaxially with respect to the male screw shell and distally with respect to the ballast housing, and capable of emitting light, when energized, in the proximal and distal directions;
a plurality of electrical conductors connecting the male screw shell, the lamp and the ballast into an operative circuit to light the lamp with electrical power applied to the male screw shell;



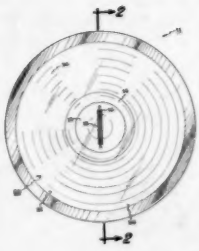
a generally concave reflector partially enclosing the lamp and attached to the ballast housing, so contoured as to receive incident light from the lamp emitted in the proximal direction and to reflect the incident light generally in the distal direction; and
a lens attached at its perimeter to the perimeter of the reflector and completing the enclosure of the lamp, so oriented as to transmit incident light from the lamp emitted in the distal direction, and also to transmit incident light reflected in the distal direction by the reflector.

4,420,800

REFLECTOR LAMP WITH SHAPED REFLECTOR AND LENS

David D. Van Horn, East Cleveland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 218,932, Dec. 22, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,334
Int. Cl.³ F21V *7/00*
U.S. Cl. 362—297 **18 Claims**



1. A reflector lamp comprising a finite light source positioned substantially at the focal point of a reflector, said reflector having a substantially parabolic front section as a primary reflecting surface, a substantially spherical intermediate section, and a substantially parabolic rear section, each of said sections having substantially the same common focal point,

said light source located at least three times as far from the front opening of said reflector as from the vertex of said primary reflective surface so that substantially more than half of the total light is reflected by the reflector, and a lens positioned over the front of said reflector and contoured at least near the outer edge thereof to refract in a more frontwardly direction at least some of the unreflected divergent light from said light source.

4,420,801

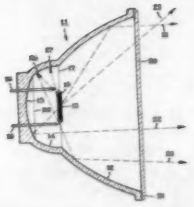
REFLECTOR LAMP

Gilbert H. Reiling, Chardon; John M. Putz, Twinsburg, and David D. Van Horn, East Cleveland, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 165,610, Jul. 3, 1980, abandoned. This application Feb. 26, 1982, Ser. No. 352,741

Int. Cl.³ F21V *7/00*

U.S. Cl. 362—297 **7 Claims**



1. A lamp comprising a concave reflector having a front section substantially defined by the surface of revolution of a first parabolic curve whose focal point is relatively close to its vertex with the surface terminating essentially at its latus rectum,

an intermediate section of substantially spherical configuration having its center substantially at the focal point of said front section and a diameter essentially equal to the length of said latus rectum,

a rear section substantially defined by a surface of revolution of a second parabolic curve whose focal point is substantially farther from its vertex than said first parabolic curve with said two focal points being substantially coincident, and

a finite light source positioned substantially at said substantially coincident focal points wherein said rear section terminates at the circular junction with said spherical intermediate section so that substantially all light rays from said light source which are reflected by said spherical intermediate section are re-reflected by said parabolic front section.

4,420,802

LIGHTING FIXTURE WITH THERMAL PROTECTOR BRACKET

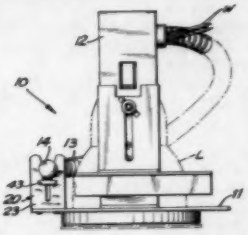
Paul R. Smester, Mount Sinai, and Edison A. Price, New York, both of N.Y., assignors to Edison Price, Incorporated, New York, N.Y.

Filed Apr. 14, 1983, Ser. No. 484,890

Int. Cl.³ F21S *1/06*

U.S. Cl. 362—364 **9 Claims**

1. In a recessed incandescent lighting fixture having a faceplate and a wireway spaced from said faceplate for holding a bulb socket and for effecting the electrical connections to the fixture, the improvement comprising: a substantially cylindrical thermal protector connected to said wireway by a wireway extension comprising a flexible metallic conduit; and a bracket for releasably retaining the protector and cable on the rear surface of the faceplate, the bracket comprising a base member mounted on the rear surface of the faceplate, a first mounting member extending outwardly from the base member and having means forming a first slot therein for releasably retaining the thermal protector, a second mounting member extending outwardly from the base member and spaced apart from the first mounting member, the second mounting member having means including two bendable arms forming a second slot for releasably receiving the minor root diameter of the conduit,



and a spacing member having end portions disposed in the slots between the base member and the protector and conduit and having deflecting means disposed at the one end portion received in the second slot for deflecting the two arms relative to each other at an angle substantially equal to the pitch of the conduit thread.

4,420,803

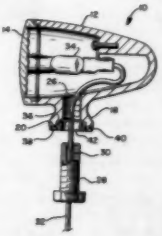
HOUSING FOR FORMING A VEHICLE LIGHT ASSEMBLY

Alwin J. Stabel, St. Paul, and James M. Preisler, Mound, both of Minn., assignors to Drag Specialties, Inc., Minnetonka, Minn.

Filed Jun. 28, 1982, Ser. No. 392,874

Int. Cl.³ F21V *15/04, 33/00*; B60Q *1/04*

U.S. Cl. 362—369 **2 Claims**



1. A vehicle light assembly comprising:

(a) an integral body having a top surface, a bottom surface, side surfaces, a closed back end, an open front end, an interior chamber, a mounting base with a flat mounting surface on the lower end extending downward from the bottom surface, and a single threaded orifice extending through the base to the chamber;

(b) a generally arcuate light transmitting lens mounted to the front end of the body to close the interior chamber;

(c) an electrical light source mounted to the body within the chamber and positioned so that light emitted by the electrical light source is directed out of the chamber through the lens;

(d) threaded mounting means constructed and arranged for engagement with the threaded orifice in the mounting base to permit mounting of the body to a vehicle, the bolt having a head, a threaded shank and an orifice extending longitudinally through the mounting means; and

(e) an electrical conductor connected at one end to the light source and extending out of the chamber through the

orifice in the mounting means for permitting electrical power to be provided to the light source.

4,420,804

SWITCHING REGULATOR WITH BASE CHARGE REMOVAL CIRCUIT

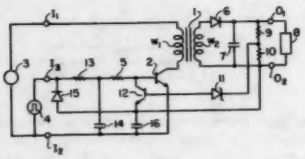
Hisao Nishino, Sendai, Japan, assignor to Tohoku Metal Industries, Ltd., Sendai, Japan

Filed Aug. 25, 1981, Ser. No. 296,113

Claims priority, application Japan, Aug. 26, 1980, 55-116412; Aug. 26, 1980, 55-116413

Int. Cl.³ H02P *13/22, 13/30*

U.S. Cl. 363—21 **10 Claims**



1. In a switching regulator wherein the on-off operation of a first switching transistor is controlled in response to an error signal detected in DC load voltage to regulate the load voltage at a constant level, the improvement comprising a circuit for controlling said first switching transistor, which comprises:

square-wave pulse generating means for generating AC square-wave pulses at a constant repetition frequency;

triangular-wave forming means for forming triangular-wave pulses from said square-wave pulses;

means including diode means and capacitance means connected in series with one another between output terminals of said square-wave pulse generating means, for providing a voltage potential at a common connection point between said diode means and said capacitance means, said voltage potential being negative in relation to the output voltage of said triangular-wave forming means; and

variable impedance means connected between the output of said triangular-wave forming means and said common connection point at the negative voltage potential so that the triangular-wave pulses are biased to be negative in voltage potential at each valley of the triangular-wave pulses, said variable impedance means being operative to vary its impedance in response to the error signal, the biased triangular-wave pulses produced by said variable impedance means providing a control signal coupled to said first switching transistor for controlling turn-on and off operation of said first switching transistor.

4,420,805

PROTECTIVE RELAYING SYSTEM

Mitsuru Yamaura, Hachiooji; Ryotaro Kondow, Tokyo, and Junichi Inagaki, Fuchu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 20, 1981, Ser. No. 236,602

Claims priority, application Japan, May 20, 1980, 55-65882

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—184 **25 Claims**

1. A protective relaying system comprising:

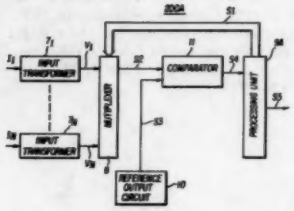
reference output circuit means for producing a digital signal;

conversion means coupled to said reference output circuit means for receiving said digital signal and for converting said digital signal into a reference signal;

processing means coupled to said conversion means for receiving said reference signal, for inverting said reference signal into an inverted reference signal, and for selecting one of said reference signal and said inverted reference signal to produce a digital reference output signal, said processing means including means for producing a selection signal;

selection means for receiving a plurality of input signals from a source, said selection means being coupled to said processing means for receiving said selection signal and for selecting one of said plurality of input signals to produce a selected input signal based on said selection signal;

digital to analog converter means coupled to receive said digital reference output signal from said processing means for converting said digital reference output signal into an analog reference signal; and



comparison means coupled to receive said selected input signal from said selection means and coupled to receive said analog reference signal from said digital to analog converter means for comparing said selected input signal with said analog reference signal and for producing a decision signal in digital form according to the result of the comparison;

wherein said processing means is coupled to receive said decision signal from said comparison means for processing said decision signal to produce a relay output signal.

4,420,806

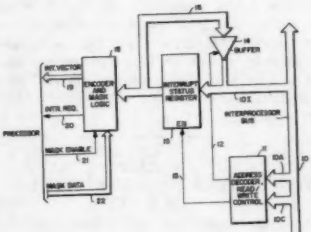
INTERRUPT COUPLING AND MONITORING SYSTEM

Mize Johnson, Jr., West Melbourne, and Harold J. Miller, Brevard County, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jan. 15, 1981, Ser. No. 225,270

Int. Cl.³ G06F *11/30*

U.S. Cl. 364—200 **18 Claims**



1. For use in a data processing system wherein a plurality of devices are intercoupled by way of an interrupt signal conveying transmission link to provide interrupt signals to each other, each device having an apparatus associated therewith for intercoupling said interrupt signals among said devices, said apparatus comprising:

first means for storing interrupt signals conveyed thereto over said transmission link from said plurality of devices, and

second means responsive to an address signal from a device representative of said associated device for causing an

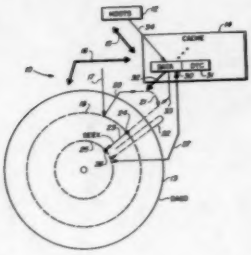
interrupt signal stored by said first means to be coupled to said transmission link.

4,420,807

SELECTIVELY HOLDING DATA IN A BUFFER FOR DEFECTIVE BACKING STORE TRACKS

Arthur H. Nolta, and David G. Reed, both of Pima County, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1981, Ser. No. 298,034
Int. Cl.³ G06F 13/00, 11/00; G11C 11/40
U.S. Cl. 364—200 22 Claims



1. The machine-implemented method of operating a data memory hirarchical system having a buffer memory and a backing store having a plurality of possibly defective data storage areas with data intended to be stored in such defective areas stored in alternate areas of said backing store; means for selectively storing portions of said data stored in said backing store in said buffer memory; replacement means for managing data occupancy of data storage space in said buffer memory including removing data from said buffer memory; means for accessing the buffer memory and backing store for effecting data transfers therewith and therebetween; means for indicating a defective data storage area in said backing store;

the machine-executed steps of:

accessing desired data from said memory hierarchy system by first testing said buffer memory, if said desired data is in said buffer memory reading the desired data therefrom; and if said desired data is not in said buffer memory, accessing the desired data from said backing store;

in accessing said backing store, detecting a defective storage area wherein said desired data was to be stored, then, determining which alternate area of said backing store is storing said desired data and accessing the desired data from the determined alternate area; and

transferring said accessed desired data to said buffer memory and storing said accessed desired data in said buffer memory for a predetermined time independent of said replacement means such that said accessed desired data is not removed from said buffer memory by said replacement means but held in said buffer memory for avoiding accessing said determined alternate area during said predetermined time.

4,420,808

MULTI-AXIS FORCE STICK, SELF-TRIMMED AIRCRAFT FLIGHT CONTROL SYSTEM

Edmond D. Diamond, Huntington; Joseph R. Maciolek, Milford, and Leo Kingston, Stratford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 136,233, Apr. 1, 1980, abandoned. This application Jan. 18, 1982, Ser. No. 340,423
Int. Cl.³ G06G 7/70; B64C 11/44
U.S. Cl. 364—434 3 Claims

1. A control system for providing principal manual control to an aircraft having four control axes, said four control axes including pitch, roll, yaw and lift/speed, said control system including:

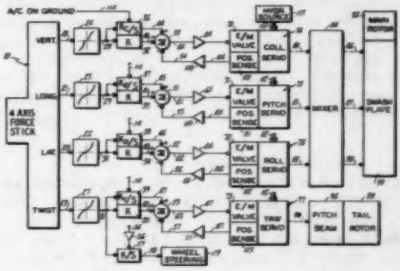
a plurality of positionable aerodynamic surfaces, the positions of which control the aircraft in said four control axes;

control means operable by a pilot to provide desired position command signals indicative of desired aerodynamic surface positions; and

positioning means connected between said control means and said aerodynamic surfaces and operative in response to said desired position command signals applied thereto to control the positioning of said aerodynamic surfaces;

characterized by said control means comprising:

a multi-axis force stick adapted to be held by the hand of the pilot for providing output signals indicative of forces



applied to the stick in at least three distinct stick axes, each of said stick axes corresponding to a related one of said aircraft control axes; and

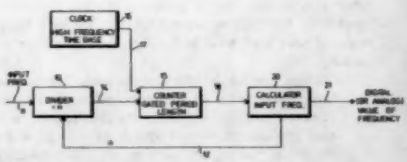
a plurality of signal processing channels, each connected for response to the output signal related to a corresponding one of said stick axes, each providing a related desired position command signal to said positioning means which is the summation of a proportional function of the related force stick output signal and an integral function of the related force stick output signal, for providing manual control of the aircraft by flying to a floating trim point established by force inputs to said force stick, the integral portion of each desired position control signal establishing the trim point for each axis and the proportional portion of each desired position control signal causing deviation from the trim point in such axis.

4,420,809

FREQUENCY DETERMINING APPARATUS

Gordon F. Pierce, Peterborough, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada

Filed May 27, 1981, Ser. No. 267,614
Claims priority, application Canada, Aug. 20, 1980, 358632
Int. Cl.³ G06F 15/20
U.S. Cl. 364—484 8 Claims



1. Frequency determining apparatus comprising,

frequency divider means for receiving an input signal of unknown frequency and dividing said input signal by a factor n to provide an adjusted signal,

gate means responsive to said adjusted signal for changing to an enabled condition for a time period related to the period of said adjusted signal,

a clock pulse generator connected to said gate means for providing thereto stable clock pulses having a predetermined frequency, and

counter means connected to said gate means for receiving said clock pulses when said gate is enabled, counting the received clock pulses, deriving from the count of the pulses obtained during a time period when the gate is enabled a value for the frequency of said adjusted signal, and multiplying said value by said factor n to provide an output signal representing the frequency of said input signal,

said counter means having a predetermined upper and lower limit for said count and being responsive to said count falling below said lower limit to increase the factor n to the next larger value in a fixed ascending series of values and being responsive to said count exceeding said upper limit to decrease the factor n to the next smaller value in said series, for maintaining the count within said upper and lower limits and said adjusted signal within a predetermined range of frequencies.

4,420,810

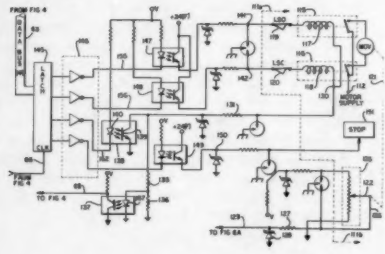
APPARATUS FOR OPERATING A MOTOR DRIVEN DEVICE AND TESTING STATE OF SERIES LIMIT SWITCH OVER SAME TWO-WIRE CIRCUIT

Rafael Hernandez, Jimenez, Mexico; Edmund E. Chow, Lilburn, Ga.; Marion L. Moncrief, Jr., and Frank S. Glass, both of Stone Mountain, Ga., assignors to Process Technologies, Inc., Tucker, Ga.

Division of Ser. No. 200,382, Oct. 24, 1980. This application Sep. 22, 1982, Ser. No. 421,141

Int. Cl.³ G01F *23/00*

U.S. Cl. 364—509 **1 Claim**



1. In a fluid storage tank including an electrically operated fluid control device including at least one operating means for activating said device in a particular direction in response to application of an operating voltage to a two wire circuit through said operating means, said operating means being in series with a limit switch for breaking continuity of said two wire circuit in response to said device reaching a predetermined operational state, the improvement of a control and testing apparatus for both operating said device and determining the state of said limit switch through said two wire circuit comprising:

switching means selectively operable for providing a first impedance state in said two wire circuit wherein said operating means will activate said device in response to said application of said operating voltage when said limit switch is closed, and alternately for providing a second impedance state in said two wire circuit wherein said operating means is inhibited from activating said device in response to said application of said operating voltage; and

testing means responsive to said switching means being in said second state and said application of said operating voltage for providing an output signal indicative of said state of said limit switch.

4,420,811

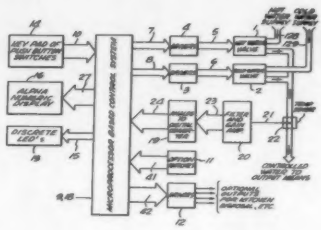
WATER TEMPERATURE AND FLOW RATE SELECTION DISPLAY AND CONTROL SYSTEM AND METHOD

Matthew G. Tarnay, Pasadena, and John T. LaBelle, Long Beach, both of Calif., assignors to Price-Pfister Brass Mfg. Co., Pacoima, Calif.

Continuation-in-part of Ser. No. 126,325, Mar. 3, 1980, abandoned. This application Feb. 5, 1981, Ser. No. 231,727

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—510 **10 Claims**



1. A system for use with a water delivery channel forming a part of a plumbing system for a building or housing structure for delivering water at a selected temperature and flow rate with separate hot and cold water source means through the water delivery channel, the system comprising:

mechanically independent valve means for controlling the flow of hot and cold water to said water delivery channel; temperature sensing means located in said delivery channel; command input means including means for turning said valves on, means for turning said valves off, and means for selecting output water temperatures ranging from a predetermined minimum to a predetermined maximum; data processing means having outputs connected to means for controlling said valve means and having inputs connected to said temperature sensing means, and to said common input means, said data processing means responding to said input means to:

a. produce a predetermined output water volume at said delivery channel upon operation of said command input means; and

b. bring the actual output water temperature to the selected output water temperature at said delivery channel while maintaining the output water flow rate at a preselected level.

4,420,812

TEACHING- PLAYBACK ROBOT

Yoshimasa Ito; Junji Hashizume, both of Yokohama; Junichi Ikeda, Tokyo; Noriyuki Utsumi, and Tessyu Naka, both of Yokohama, all of Japan, assignors to Tokico, Ltd., Kawasaki, Japan

Filed Sep. 8, 1980, Ser. No. 185,023

Claims priority, application Japan, Sep. 14, 1979, 54-118510; Oct. 19, 1979, 54-135006

Int. Cl.³ G05B *19/42*; G06F *15/46*

U.S. Cl. 364—513 **24 Claims**

1. A robot, comprising:

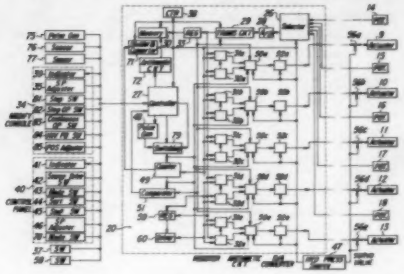
a manipulator having a plurality of movable members, each member connected to its adjacent member with a joint;

means for detecting the relative positions of adjacent movable members with respect to each other at each of the joints;

means for generating positional signals from the detecting means upon teaching operations;

memory means for successively storing positional data produced from said positional signals;

means for determining the number of interpolative positions between two of said positions based on two stored positional data entries which are read out from said memory means and for interpolating said determined number of positions between said successive two positions; and



means for positioning each of the movable members of the manipulator referring to resulting values of the determining means and interpolating means as command values and based on the the positional signals from the detecting means as present values.

4,420,813

OPERATION SEQUENCE INSTRUCTION BY SYNTHETIC SPEECH

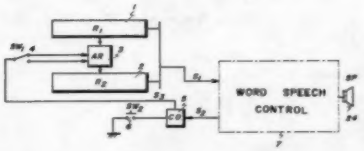
Tomohiro Inoue, Nara, and Mituhiro Saizi, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 10,323, Feb. 7, 1979. This application Sep. 22, 1980, Ser. No. 189,046

Claims priority, application Japan, Feb. 8, 1978, 53-13761

Int. Cl.³ G10L *1/00*

U.S. Cl. 364—513 **9 Claims**



1. A system for automatically instructing an operator by audibly presenting step by step instructions comprising:

first storage means for holding synthetic speech data in a plurality of locations:

second storage means for holding position data representative of the locations of said synthetic speech data, said position data being stored in a plurality of locations, each representative of an instruction;

advance means for sequentially selecting locations in said second storage means, thereby selecting instructions to be audibly reproduced in a step by step fashion;

selection means for recalling synthetic speech data from said first storage means in correspondence to the position data produced by said second storage means;

synthetic speech generation means for producing an audible instruction derived from said synthetic speech data, said instruction corresponding to the data present in the location of said second storage means selected by said advance means; and

an instruction request switch generating an instruction sequence signal when actuated;

instruction completion indication means for producing a completion signal representative of the completed generation of an audible instruction by said synthetic speech generation means;

said advance means in sequence selecting the next location in said second storage means corresponding to the next instruction to be generated upon receipt of the signal produced by said instruction request switch, said advance means inhibiting the selection of the next location in said second storage means until receipt of the completion signal produced by said instruction completion indicator means.

4,420,814

WHEEL SPEED MEASURING CIRCUIT

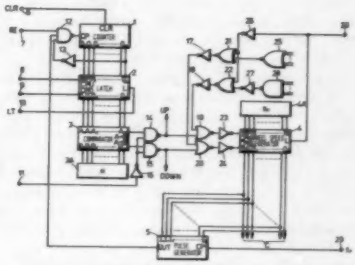
Tetsuro Arikawa; Teruo Inoue, and Yukihiro Takiue, all of Yokosuka, Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Jun. 22, 1981, Ser. No. 275,974

Claims priority, application Japan, Jun. 27, 1980, 55-88193; Jun. 13, 1981, 56-91210

Int. Cl.³ G01P *3/56*

U.S. Cl. 364—565 **15 Claims**



1. A wheel speed measuring circuit comprising:

(A) a counter controlled by a wheel speed signal having a frequency proportional to the rotational speed of the wheel, sensed by a wheel speed sensor associated with a wheel;

(B) a comparator for comparing the digital output of said counter with a predetermined digital value M, said comparator generates a first output signal when the output of said counter is less than the value M and a second output signal when the output of said counter is greater than the value M;

(C) a wheel speed generating circuit operatively connected to said comparator for generating a digital output corresponding to the rotational speed of the wheel, wherein said digital output of the wheel speed generating circuit is increased from a pre-existing digital output of said wheel speed generating circuit in response to said first comparator output signal and decreased from said pre-existing digital output in response to said second comparator output signal; and

(D) a pulse generator for generating pulses of a frequency proportional to said digital output of the wheel speed generating circuit, said pulse generator receiving said digital output of the wheel speed generating circuit, wherein said counter receives the output pulses of said pulse generator to count said output pulses for each period of the wheel speed signal or for a time interval relating to each period of the wheel speed signal, and the digital output of said counter is compared when said predetermined digital value in said comparator.

4,420,815

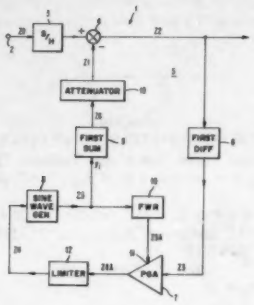
APPARATUS AND METHOD FOR REMOVAL OF SINUSOIDAL NOISE FROM A SAMPLED SIGNAL

David B. Francis, Mount Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1981, Ser. No. 264,510

Int. Cl.³ G06F *15/31*

U.S. Cl. 364—724 19 Claims



1. Digital filtering apparatus for filtering noise of a single frequency from an analog signal comprising:

means for generating a plurality of samples of said analog signal at a given sampling rate,

means connected to said generating means for cancelling said noise to provide at an output terminal samples from which said noise has been removed, and,

feedback means connected between said output terminal and said means for cancelling including means connected to said output terminal for removing DC, means connected to said means for cancelling for compensating for the effect of said means for removing, a discrete sine wave generator operating at said given sampling rate electrically connected to said means of compensating, means electrically connected to sine wave generator for applying at least a minimum value of input signal to said sine wave generator, means electrically connected via said last mentioned means to said wave generator for adjusting the amplitude of said signals from said sine wave generator such that their amplitude is increased when the amplitude of the output samples of said sine wave generator is relatively large and their amplitude is decreased when the amplitude of the output samples of said sine wave generator is relatively small, said means for adjusting further including means for applying control signals to said means for adjusting to provide an output from the latter which is directly related to the absolute value of said control signals.

4,420,816

ELECTRONIC WORD RETRIEVAL DEVICE FOR SEARCHING AND DISPLAYING ONE OF DIFFERENT FORMS OF A WORD ENTERED

Kunio Yoshida, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1979, Ser. No. 89,236

Claims priority, application Japan, Oct. 31, 1978, 53-150556[U]

Int. Cl.³ G06F *15/38*

U.S. Cl. 364—900 7 Claims

1. A word information storage and retrieval apparatus comprising:

a plurality of character keys for entering first word information representing a desired word in original form;

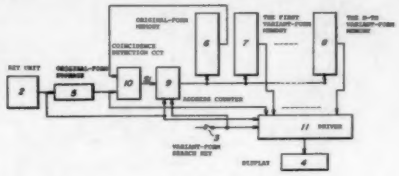
search means responsive to said plurality of character keys for searching second word information representing said desired word in a variant form, said search means including;

an original form memory for containing original forms of a plurality of words;

at least one variant form memory for containing variant forms corresponding to said plurality of words;

a counter for producing an incremental count upon the initiation of searching;

a coincidence detector for sequentially comparing said desired word with the original forms of said plurality of words stored in said original form memory;



said coincidence detector comparing said desired word with the original form of a new one of said plurality of words with each increment of said counter, a detected coincidence stopping the incremental count of said counter to thereby allow said counter to produce a signal representative of the original form of the word corresponding to said desired word;

said signal generated by said counter being used to address and recall the variant form of said desired word from one of said at least one variant form memories; and

a display responsive to said variant form of said desired word for indicating said second word information.

4,420,817

WORD ENDINGS INFLECTION MEANS FOR USE WITH ELECTRONIC TRANSLATION DEVICE

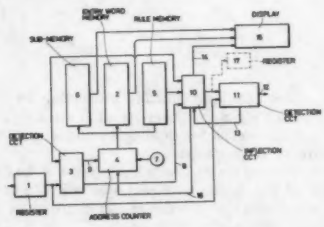
Kunio Yoshida, Tsuge, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 23, 1980, Ser. No. 152,846

Claims priority, application Japan, May 25, 1979, 54-65377; Jun. 19, 1979, 54-77738

Int. Cl.³ G06F *15/38*

U.S. Cl. 364—900 12 Claims



1. An electronic dictionary and language interpreter device wherein a first word represented in a first language is entered to obtain a second word represented in a second language equivalent to the first word,

input means for entering first words, said first words having a first uninflected portion and a second inflected portion;

first memory means provided for storing a plurality of entry words composed of the first uninflected portions of said first words;

second memory means provided for storing a certain number of rule patterns according to which inflected forms of said first words may be constructed from one of the entry words;

means responsive to the input means for addressing the first memory means and the second memory means to subsequently retrieve the entry words and the rule patterns associated therewith;

inflection control means responsive to the addressing means for inflecting the entry words according to the rule pattern; and

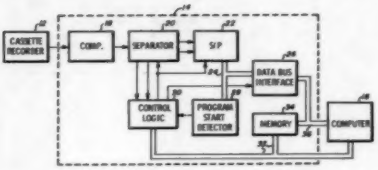
means responsive to the inflection control means for determining the equivalency between the first word entered and the inflected word formed from the entry words by the inflection control means.

4,420,818

FAST LOAD CASSETTE TAPE RECORDER INTERFACE

Lester H. Lee, Los Altos, and George Wussow, San Jose, both of Calif., assignors to Recortec, Inc., Mountain View, Calif.

Filed Mar. 12, 1981, Ser. No. 243,078
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—900 **9 Claims**



1. A cassette tape recorder interface for receiving electrical signals from a cassette tape played on a cassette tape recorder adapted to have the play head engaged while in the fast forward wind mode, comprising in combination:

a connector means for receiving electrical signals from an output of a cassette tape recorder;

a comparator means responsive to said electrical signals from said cassette tape recorder for comparing the magnitude of said electrical signals with a predetermined reference level, and generating data and clock pulses in response to those of said electrical signals which exceed said reference level, at a baud rate exceeding 8,000, whereby high speed data transfer may be accomplished with substantial rejection of noise;

a separator means responsive to said data and clock pulses for generating a separate data signal and clock signal;

a serial to parallel converter means responsive to said data signal and said clock signal for generating parallel data signals;

a data bus interface responsive to control signals for transmitting said parallel data signals;

a control means for generating said control signals;

a program start detector means responsive to said parallel data signals for detecting the start of a program stored on said cassette tape and enabling the transmission of said parallel data signals by said data bus interface, whereby the data bus interface will not transmit said parallel data signals until the start of a program is detected;

an address bus, comprising a plurality of address signals, connected to the control means and to a computer; and

an interface program memory means comprising non-volatile memory connected to the address bus for providing a plurality of pre-programmed program instructions to the computer via a data bus in response to address signals from the computer, with the control means being responsive to address signals transmitted on said address bus by said computer in response to said program instructions provided to the computer from the memory means via said data bus;

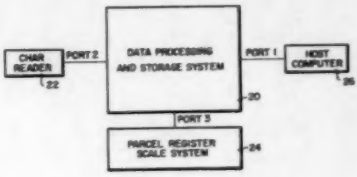
whereby parallel data signals are generated and transmitted in response to electrical signals received from the cassette tape recorded at high speed, and in accordance with pre-programmed instructions contained in the interface program memory means.

4,420,819

SYSTEM FOR PROCESSING AND STORING TRANSACTION DATA AND FOR TRANSMITTING THE TRANSACTION DATA TO A REMOTE HOST COMPUTER

Robert J. Price, and Bruce E. Taber, both of El Cajon, Calif., assignors to Data Card Corporation, Minnetonka, Minn.

Filed Mar. 13, 1981, Ser. No. 243,541
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—900 **18 Claims**



1. A data processing and storage system for processing and storing transaction data relating to a plurality of parcels and for transmitting the transaction data to a remote host computer, comprising:

means for providing a character information signal including character data;

means for providing a scale data signal including scale data;

a programmable communications interface unit, operatively connected to said means for providing a character information signal, said means for providing a scale data signal, and to the remote host computer, for receiving said character information signal and said scale data signal, and for providing, as an output, said character data and said scale data;

a central processing unit, operatively connected to said programmable communications interface unit, for providing an I/O control signal to said programmable communications interface unit, for processing the transaction data comprising said character data and said scale data, for sorting the transaction data, for providing, as an output to be stored, the transaction data, and for generating a read signal;

a dynamic memory, operatively connected to said central processing unit, for use as temporary storage by said central processing unit when said central processing unit is sorting the transaction data; and

semi-permanent memory means, operatively connected to said central processing unit, for storing the transaction data processed by said central processing unit and for reading out the stored transaction data to said central processing unit in dependence upon said read signal, whereupon said central processing unit provides the transaction data to said programmable communications interface unit for transmission to the remote host computer.

4,420,820

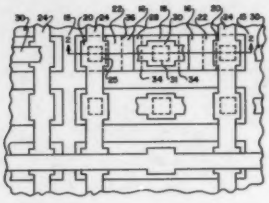
PROGRAMMABLE READ-ONLY MEMORY

David R. Preedy, Colorado Springs, Colo., assignor to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 220,459, Dec. 29, 1980, abandoned. This application Mar. 30, 1983, Ser. No. 479,344
Int. Cl.³ G11C *11/36*
U.S. Cl. 365—105 **17 Claims**

1. A semiconductor memory cell, comprising: (a) a semiconductive body; (b) a layer of insulating material on a surface of said body; (c) a layer of polysilicon on said insulating layer and

including a first region of first type conductivity, a second region of first type conductivity spaced laterally from said first region, a third region of second type conductivity between said first and second regions and forming a first semiconductive junction with said first region, said third region differing in impurity concentration from said first region, and a fourth region of second type conductivity between said first and second regions and forming a second semiconductive junction with said second region, said fourth region at least adjoining said third region and differing in impurity concentration from said second region, said first semiconductive junction having a lower reverse bias breakdown voltage than said second semi-



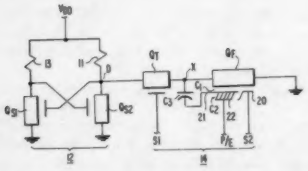
conductive junction; (d) a first metal contact forming one terminal of said memory cell and contacting said first region on one side of said first semiconductive junction; (e) a second metal contact forming another terminal of said memory cell and contacting said polysilicon layer on the other side of both said first and second semiconductive junctions and conductively coupled to said second region; (f) the surfaces of said third and fourth regions being free of any metal contact; (g) said first semiconductive junction serving as a programming diode when a voltage is applied across said first and second metal contacts with polarity and magnitude to cause reverse-bias breakdown of said first semiconductive junction.

4,420,821

STATIC RAM WITH NON-VOLATILE BACK-UP STORAGE AND METHOD OF OPERATION THEREOF

Charles R. Hoffman, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 19, 1982, Ser. No. 350,480
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—154 **12 Claims**



1. A semiconductor memory array having a plurality of memory cells, each of said cells comprising:

a static volatile memory element including at least one data node; and

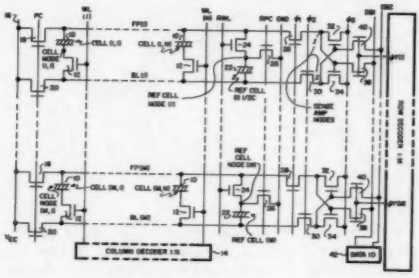
a non-volatile memory element coupled to said static memory element for storing data from said static memory unit and transferring data to said static memory unit in a non-volatile manner, said non-volatile memory unit comprising switch means for coupling said data node to a second node in response to a first control signal, and a dual gate FET having a channel connected to said second node, said dual gate FET having first and second gates for controlling a channel conductivity of said dual gate FET with said first gate being connected to receive a second control signal and said second gate being a floating gate, a control electrode connected to receive a third control signal, and a segment of DEIS material disposed between said control electrode and said second gate, said first and second gates being separated from said channel of said dual gate FET by a gate oxide layer.

4,420,822

FIELD PLATE SENSING IN SINGLE TRANSISTOR, SINGLE CAPACITOR MOS RANDOM ACCESS MEMORY

Joannes J. M. Koomen, Waalre, and Roelof H. W. Salters, Geldrop, both of Netherlands, assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Mar. 19, 1982, Ser. No. 360,088
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—182 **6 Claims**



1. A memory array, comprising:

(a) a plurality of memory cells arrayed in rows and columns;

(b) a bit line and a field plate line for each row;

(c) a word line for each column;

(d) each memory cell including a memory cell transistor and a memory cell capacitor coupled in series between a bit line and a field plate line respectively, with the gates of the memory cell transistors in the same column coupled to a common word line;

(e) a column including a reference cell capacitor and a reference cell transistor in each row coupled in series between the field plate line and the bit line, respectively, of the corresponding row;

(f) a reference word line for said column in (e) coupled to the gates of said reference cell transistors;

(g) a column including a sense amplifier in each row having means for coupling one input to the field plate line and the other input to the bit line of the corresponding row; and

(h) means for connecting and disconnecting said field plate lines and said bit lines to and from a voltage supply for precharging them to the same d.c. potential.

4,420,823

SEMICONDUCTOR MEMORY

Hiroshi Shimada, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 24, 1980, Ser. No. 219,949
Claims priority, application Japan, Dec. 25, 1979, 54-169067
Int. Cl.³ G11C *7/02*
U.S. Cl. 365—206 **11 Claims**

1. A static semiconductor memory operatively connected to receive a first power supply voltage and a second power supply voltage lower than the first power supply voltage, and having a power-down mode, comprising:

memory cells;

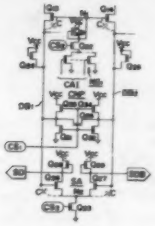
word lines respectively, operatively connected to a corresponding one of said memory cells;

bit line pairs respectively, operatively connected in parallel to a corresponding one of said memory cells;

data bus pairs, each having a first and a second end and operatively connected in series to at least a respective one of said bit line pairs;

sense amplifiers, each operatively connected to a respective one of said data bus pairs;

transfer gates, each operatively connected in series between a respective one of said bit lines and a respective one of said data bus pairs;



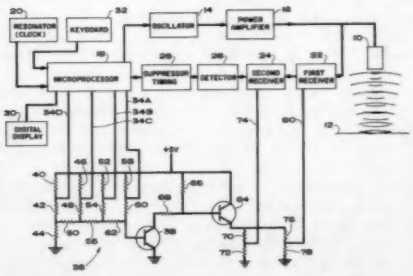
coupling noise cancellers each connected to a respective one of said data bus pairs and to receive said second supply voltage, said data bus pairs being connected at said first end to a respective one of said bit line pairs via a respective one of said transfer gates and the second end to a respective one of said sense amplifiers, for clamping the data bus pairs to a predetermined potential when the static semiconductor memory is switched to the power-down mode, and for discharging said data bus pairs to said second power supply voltage.

4,420,824

SONAR APPARATUS HAVING IMPROVED GAIN CONTROL

Ronald G. Weber, Tulsa, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.

Continuation of Ser. No. 253,216, Apr. 13, 1981, abandoned.
This application Feb. 7, 1983, Ser. No. 464,414
Int. Cl.³ G01S *15/08, 7/52*
U.S. Cl. 367—98 **7 Claims**



1. A sonar device for use on a boat to indicate the depth of water on a digital display including a transducer positioned in the water to transmit bursts of sound energy and for receiving echo energy reflected from the bottom, at least one variable gain receiver stage for amplifying the echo signals received by the transducer, the gain of said variable gain receiver stage being a function of an analog gain control voltage applied to said receiver; means for controlling the gain of said receiver stage comprising;

(a) a microprocessor means for processing the amplified received signals to determine the time of travel of said transmitted and reflected signals, and to supply appropriate control signals to the digital display to indicate depth of the reflector as a function of time required to receive the echo signals;

(b) said microprocessor means supplying also binary control signals to at least four parallel inputs to a ladder type resistive network means;

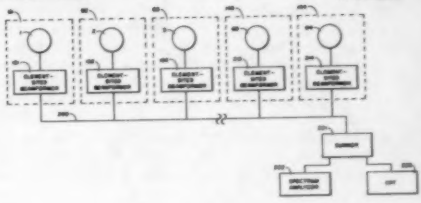
(c) said ladder type resistive network means in cooperation with at least one stage of emitter following providing a variable d.c. analog gain control signal to said variable gain receiver stage.

4,420,825

ELEMENT-SITED BEAMFORMER

Robert L. Maynard, Manchester; Samuel S. Ballard, Hollis, and Robert L. Townsend, Amherst, all of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed May 15, 1981, Ser. No. 263,455
Int. Cl.³ G01S *3/80*
U.S. Cl. 367—122 **5 Claims**



1. A system for the direct formation of directional beams from individual hydrophones of a hydrophone array in which the hydrophones are coupled to an array cable, the system comprising:

(a) a plurality of amplifying means located at the site of respective ones of the individual hydrophones for converting hydrophone signal voltages into data that may be sampled, the input of each of said amplifying means being coupled to the output of a particular hydrophone in said array;

(b) a plurality of delaying means located at the site of respective ones of the individual hydrophones for receiving, storing and delaying the output data from the associated one of said amplifying means, the input of each of said delaying means being coupled to the output of said amplifying means which is located at the same hydrophone as said delaying means;

(c) a plurality of controlling means located at the site of respective ones of the individual hydrophones for controlling the output of said delaying means so that only data samples that represent the beam currently being formed will be output by said delaying means at a specified time, the input of each of said controlling means being coupled to the output of said delaying means which is located at the same hydrophone as said controlling means;

(d) a plurality of coupling means located at the site of respective ones of the individual hydrophones for coupling the output data of said delaying means to said array cable at the time specified by said controlling means, the input of each of said coupling means being connected to the output of said delaying means which is located at the same hydrophone as said coupling means, and the output of each of said coupling means being coupled to said array cable; and

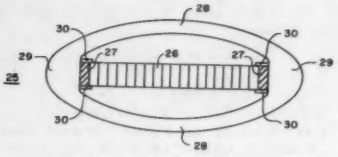
(e) a summer which is coupled to said array cable, said summer being adapted to sum the data placed on said cable, whereby the beams detected by each of said hydrophones will be obtained in sequence from said array cable.

4,420,826

STRESS RELIEF FOR FLEXTENSIONAL TRANSDUCER

William J. Marshall, Jr., Nashua, and Ronald P. White, Amherst, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jul. 6, 1981, Ser. No. 280,637
Int. Cl.[3] H04R 17/00
U.S. Cl. 367—167 5 Claims



1. In an underwater flextensional acoustical transducer comprising a cylindrical shell with an extendable driver stack disposed in an operable position between opposed sides of the shell in a longitudinally prestressed state, the improvement to prevent damage to the driver stack from negative stress resulting from overpressurization of the transducer comprising:

(a) one of the ends of the driver stack being adapted to move longitudinally away from its respective side of the shell during an overpressurization condition of the transducer; and

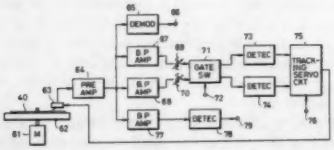
(b) guide means operably disposed adjacent said end and its respective side for guiding said end back into its operable position as said overpressurization condition is removed.

4,420,827

DISC REPRODUCING SYSTEM

Yoshiyo Wada; Hisao Kinjo, both of Yokohama, and Ichiro Ueno, Isehara, all of Japan, assignors to Victor Company of Japan Ltd., Yokohama, Japan

Continuation of Ser. No. 876,559, Feb. 9, 1978, abandoned. This application Sep. 11, 1980, Ser. No. 186,297
Claims priority, application Japan, Feb. 9, 1977, 52-13322; Feb. 12, 1977, 52-14438; Feb. 14, 1977, 52-14870; Feb. 23, 1977, 52-18056; Feb. 23, 1977, 52-18057
Int. Cl.[3] H04N 5/83; G11B 11/00, 21/10
U.S. Cl. 369—43 4 Claims



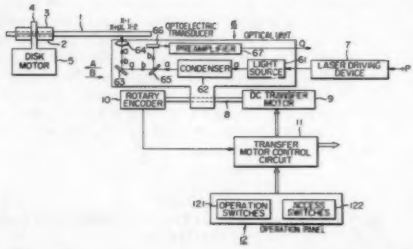
1. An information reproducing system comprising an information signal recording medium of the rotary type and a reproducing apparatus for reproducing information recorded on said medium, said reproducing apparatus having a reproducing transducer provided with an electrode, said recording medium comprising an electroconductive member which has a flat surface with a first succession of pits formed therein as respective concavities in accordance with an information signal, said first succession defining a track and with a second succession of pits formed therein as respective concavities in accordance with a reference signal, said second succession of pits being formed at positions substantially intermediate between the centerlines of adjacent tracks formed by the first succession of pits, the electroconductive material of said recording medium and the electrode of said transducer forming a capacitive structure, said information and reference signals of the first and second succession of pits being reproduced simultaneously by the reproducing transducer in response to variations of capacitance between the surface of said electroconductive member and the electrode of the transducer, each pit of said first succession of pits respectively having widths W1 and W2 and depths D1 and D2, and the relationships between said widths and said depths being so selected that the pit width W1 is greater than the pit width W2, and the pit depth D1 is greater than the pit depth D2 so that the levels L1 and L2 of said information and reference signals which are reproduced when said first and second succession of pits are reproduced by the reproducing transducer will be such that the level L1 is greater than the level L2, and the difference between the levels L1 and L2 will be greater than a specific level difference.

4,420,828

OPTICAL RECORDING AND/OR REPRODUCING DEVICE

Tomio Yoshida, Katano; Michiyoshi Nagashima, Ikoma; Shunji Harigae, Neyagawa; Makoto Ichinose, Moriguchi, and Noboru Wakami, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 15, 1980, Ser. No. 216,272
Claims priority, application Japan, Dec. 14, 1979, 54-163418
Int. Cl.[3] G11B 21/02, 7/12
U.S. Cl. 369—47 1 Claim



1. An optical reproducing device utilizing an optical record disk having concentric circular guide tracks and spiral guide tracks intermingled thereon, each of said circular tracks and portions of each spiral track with different radii having optically readable information signals therein and an address sector containing an optically readable address signal, said sectors being aligned along a diameter of said disk and subtending the same radial angle, said device comprising:

an optical transducer head;

a disk carrier for supporting and rotating said optical record disk;

transport means for providing relative radial movement between said optical transducer head and said disk carrier;

address reading means coupled to said optical transducer head for reading out the address signal from each address sector of said disk;

track address change detection means coupled to said address reading means for providing a circular track indication signal when successive address signals read out by said address reading means have identical values, and for providing a spiral track indication signal when said successive address signals have different values from each other;

transport control means coupled to said track address change detection means and to said transport means for (i) causing said transport means to provide continuous relative movement between said optical transducer head and said disk carrier in response to said spiral track indication signal, and (ii) interrupting the operation of said transport means to halt said relative radial movement in response to said circular track indication signal; and

reproduce control means responsive to said address signals for reproducing said information signals,

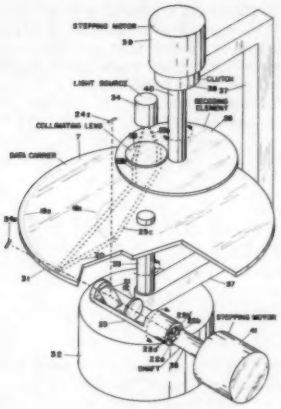
whereby said device may reproduce signals recorded on intermingled circular and spiral tracks of an optical record disk.

4,420,829

HOLOGRAPHIC SYSTEM FOR THE STORAGE OF AUDIO, VIDEO AND COMPUTER DATA

John E. Carlson, 3440 E. Pontaluna, Fruitport, Mich. 49415

Filed Jan. 8, 1981, Ser. No. 223,284
Int. Cl.³ G11B 7/00
U.S. Cl. 369—103 24 Claims



1. Apparatus for playback from holographic storage on a data carrier in which holographic data is arranged in a predetermined pattern of linear arrays comprising:

a data carrier receiver for receiving such a data carrier;

a source of coherent radiation positioned relative to said data carrier receiver to illuminate such a data carrier thereon with an illumination pattern which is effective to illuminate any given linear array of holograms when that linear array is disposed within the illumination pattern and to form a signal beam comprising as constituents individual signals each corresponding to a corresponding hologram in that linear array,

a reflector disposed in the path of said signal beam for altering the direction of said signal beam,

photodetector means disposed in the path of the directionally altered signal beam,

a lens disposed between said photodetector means and said reflector in the path of said directionally altered signal beam whereby said directionally altered signal beam is focused upon said photodetector means,

means for selectively positioning said data carrier receiver and such a data carrier thereon relative to said source of coherent radiation to selectively position a selected one of said linear arrays of holograms on such data carrier into said illumination pattern;

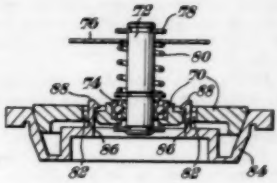
and means for selectively positioning said reflector to cause a selected one of the holograms in such selected one of said linear arrays to impinge upon said photodetector means.

4,420,830

DISC MOUNTING AND CENTERING DEVICE

Keith Green, Kinross-Shire, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 3, 1981, Ser. No. 270,198
Claims priority, application United Kingdom, Jul. 1, 1980, 8021514
Int. Cl.³ A63D 7/00
U.S. Cl. 369—261 11 Claims



1. In an assembly for centering a flexible disc with a central locating hole, the assembly having a rotatable spindle with a face and apparatus for centering the flexible disc on the face, the rotatable spindle having a circular coaxial opening in the face, the disc central locating holes being centered about the spindle opening, the apparatus for centering including an expandable circular shell and a rigid expander, the shell insertable through the central locating hole into the spindle opening, the expander insertable into the shell to expand the shell to engage both the inside of the hole in the disc and the inside of the opening to center the disc, the improvement comprising:

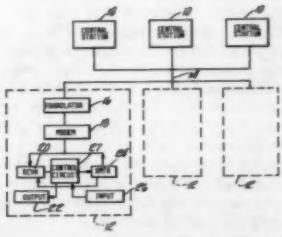
coupling means including fingers on said shell intermediate between said shell and expander and including engaging means for said fingers on said expander, said coupling means being intermediate between said expander and said shell, said engaging means on said expander mechanically engaging said fingers on said shell to withdraw said shell from said opening whenever said expander is withdrawn more than a predetermined distance from said opening.

4,420,831

METHOD AND DEVICE FOR FREQUENCY TRANSLATION

Brian K. Hackett, Ypsilanti, Mich., assignor to Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Division of Ser. No. 191,208, Sep. 26, 1980, Pat. No. 4,375,691.
This application Sep. 27, 1982, Ser. No. 424,701
Int. Cl.³ H04J 4/00, 6/00
U.S. Cl. 370—50 4 Claims



1. A digital communication system comprising:

a plurality of terminals;

a plurality of master stations connected to all of the terminals by a communication line carrying a plurality of duplex communication channels each associated with one of said master stations;

means for storing a unique address at each of the terminals;

counters associated with each of the master stations and with each of the terminals;

means at each terminal for detecting the coincidence between the status of its counter and its address storage means;

means at each of the master stations for sending digital words to all of the terminals on that master station's channel, said words including an address of one of the terminals followed by data to be received by that terminal;

means for advancing the master counter and each of the remote counters each time a digital word is sent from the master station to any of the terminals on that master station's channel;

means at each terminal allowing the terminal to send a message to one of the master stations upon occurrence of coincidence between the terminal's counters and its address memory;

means at each of the master stations for periodically transmitting a resynchronizing word to all of the terminals on the channel corresponding to the master station transmitting said word; and

means operably coupled between each of the terminals and the communications line for selecting the channel over which a terminal may communicate with the corresponding master station.

4,420,832

CONCENTRATOR-DECONCENTRATOR DEVICES

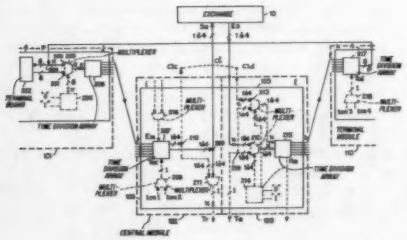
Jacques E. Salle; Jean A. M. Jossif; Gilbert J. M. Rathier, and Jean-Pierre Vales, all of Colombes, France, assignors to Le Materiel Telephonique Thomson-CSF, Paris, France

Filed Apr. 21, 1980, Ser. No. 141,904

Claims priority, application France, Apr. 25, 1979, 79 10471

Int. Cl.³ H04Q *11/04*

U.S. Cl. 370—56 **7 Claims**



1. A concentrator-deconcentrator device for association with a time-division telephone exchange and for establishing space-time paths between subscriber PCM trunks connected to a group of subscriber and line connecting units and exchange PCM trunks connected to the exchange, comprising:

a concentrator including a first decentralized part having an output section and a first centralized part;

a deconcentrator including a second decentralized and a second centralized part;

wherein said first centralized part and said second centralized part make up a centralized unit having an input section and outputs, said centralized unit being comprised of a plurality of central modules;

wherein each of said central modules includes symmetrical time-division arrays inserted between the exchange PCM trunks and the subscriber PCM trunks;

wherein said first decentralized part and said second decentralized part make up a decentralized unit, said decentralized unit being composed of a plurality of terminal modules;

wherein each of said terminal modules include symmetrical time-division arrays inserted between the subscriber PCM trunks and the subscriber and line connecting unit;

wherein each of said plurality of central modules is connected to each of said plurality of terminal modules; and

wherein said first centralized part of said concentrator is connected to said second centralized part of said deconcentrator by means of the exchange PCM trunks wherein each central module comprises a third symmetrical time-division array connected by at least one input to the output of a first symmetrical time-division array and by at least one output to exchange and local connection PCM trunks, and a fourth symmetrical time-division array connected by at least one input to exchange PCM trunks via a second group of multiplexers and to local connection PCM trunks via a third group of multiplexers whose outputs are connected to the inputs of the second symmetrical time-division arrays.

4,420,833

UNIDIRECTIONAL DATA TRANSMISSION SYSTEM

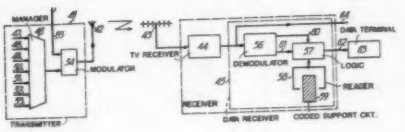
Yves M. Noirel, Montfort, France, assignor to Etablissement Public de Diffusion dit "Telediffusion de France" and L'Etat Francais, represente par le Secretaire d'Etat aux Postes et Telecommunications et a la Telediffusion

Filed Sep. 22, 1980, Ser. No. 189,080

Claims priority, application France, Sep. 27, 1979, 79 24570

Int. Cl.³ H04J *3/16*

U.S. Cl. 370—83 **2 Claims**



1. A system for broadcasting data in the form of data packets sent from a transmitting station; said data packets including numerical data received from at least one of a plurality of incoming paths and combining such data into a format comprising a prefix containing synchronization and path identification code signals, said packet also including a format signal indicating the length of the successive data words which follow the prefix; said system comprising:

a transmitting station having a plurality coupling means, one coupling means being individually associated with each of said incoming paths;

common governing means for controlling all of said plurality of coupling means, each of said coupling means having an individual input circuit menas coupled to receive data over the incoming path which is individually associated with the coupling device;

multiplexing means for preparing said data packets for transmission;

data memory means individually associated with each of said input circuit means for driving said multiplexing means under control of said common governing means;

counter means operated at a pre-determined bit clock rate for retaining a memory of the amount of data stored in said data memory;

means responsive to at least a partial filling of said data memory means as indicated by said counter means for inhibiting the input circuit means associated therewith;

means responsive to said inhibiting of said input circuit means for connecting said data memory means to the multiplexing means and emptying the data memory means, and for resetting the counter means, the inhibition being removed on the emptying of said memory means;

a register means having an adjustable maximum capacity for causing said inhibition order to be given when the count of said data again reaches a pre-determined value; and

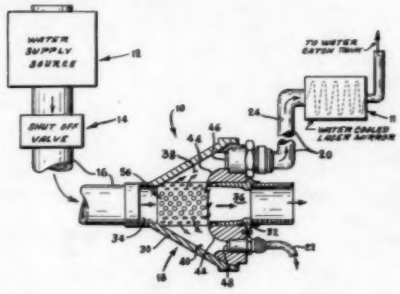
a small capacity buffer memory means interposed between said input circuit means and its individually associated data memory means for smoothing the flow of said data into said data memory means, the reading of the data into and out of the buffer memory being governed by a programmer means associated with said coupling means.

4,420,834

FLOW ATTENUATOR FOR USE WITH LIQUID COOLED LASER MIRRORS

Walter H. Wiley, III, Palm Beach Gardens, Fla., and John A. Gunn, Norcross, Ga., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 10, 1981, Ser. No. 272,441
Int. Cl.³ H01S *3/04*
U.S. Cl. 372—35 **12 Claims**



1. In a laser system having at least one liquid cooled laser mirror, a liquid coolant supply source and a supply line to feed said liquid coolant to said laser mirror, the improvement comprising a flow attenuator operably connected to said supply line, said flow attenuator comprising a housing, said housing being open at one end thereof, said open end being connected to said supply line, a centrally located passageway extending longitudinally from said open end, at least one chamber extending from said passageway, said chamber having an entrance opening at one end thereof connected to said passageway, said chamber having an exit opening at the other end thereof connected to said liquid cooled mirror, and a distribution screen having a plurality of openings therein being secured within said passageway adjacent said entrance opening of said chamber whereby liquid flow induced jitter in said laser mirror is substantially eliminated as said coolant flows from said supply source to said laser mirror.

4,420,835

HOLLOW CATHODE LASER

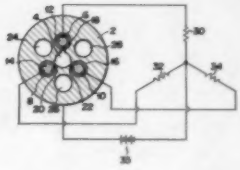
Shuzo Hattori, Nagoya; Noboru Kamide, Tokyo; Katsumi Tokudome, Hidakamachi; Michio Ishikawa, and Yuji Hayashi, both of Kawagoe, all of Japan, assignors to Kimmon Electric Co., Ltd., Tokyo, Japan

Filed May 28, 1981, Ser. No. 268,063
Int. Cl.³ H01S *3/097*
U.S. Cl. 372—88 **9 Claims**

1. A hollow cathode laser system comprising:

an elongated hollow cathode body (2) having a cathode hole (4) extending coaxially within said cathode body (2); a plurality of anode holes (6, 8, 10) formed in said cathode body (2) around said cathode hole (4) and extending in the same direction as said cathode hole (4); and a plurality of elongated slits extending along said anode holes (6, 8, 10) through which said anode holes (6, 8, 10) communicate with said cathode hole (4); said cathode hole (4) and anode holes (6, 8, 10) being filled with discharge gas for producing a laser active medium, said discharge gas being capable of emitting coherent radiation;

a plurality of elongated anodes (12, 14, 16) extending through said anode holes (6, 8, 10), respectively, each anode having an elongated producing portion (18, 20, 22) protruding in said slit of the respective anode hole, and each anode having an outer surface spaced by a predetermined distance from the inner surface of said cathode body (2) defining the respective anode hole (6, 8, 10) so that the outer surface of each anode is substantially equidistant at substantially all points from the inner surface of its respective anode hole, even at their protruding portions;



a voltage source (35) coupled to said anodes and to said cathode body for applying a voltage between said cathode body (2) and said anodes (12, 14, 16) to produce negative glow discharge in said cathode hole (4), thereby exciting said laser active medium;

a pair of mirrors (50) forming an optical cavity in said cathode hole (4), for amplifying stimulated emissions from said laser active medium; and

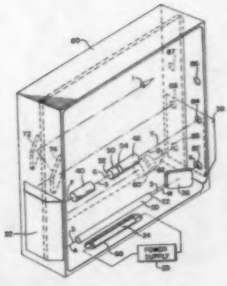
means (38, 40, 48, 52) coupled to said cathode body (3) for sealing said cathode hole (4) and said anode holes (6, 8, 10).

4,420,836

LASER RESONATOR

Lawrence L. Harper, Monroe, La., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 5, 1981, Ser. No. 270,763
Int. Cl.³ H01S *3/08*
U.S. Cl. 372—98 **18 Claims**



1. A feedback configuration in an optical instrument, comprising:

a plurality of oppositely disposed means for folding opposite ends of a beam of electro-magnetic energy into a plurality of spaced apart paths, each of said folding means in a terminal relation with all of said paths; and

unitary means interposed into one of said paths, for concertedly reversing the directions of the opposite ends of said beam along said paths.

4,420,837

Patent Not Issued For This Number

4,420,838

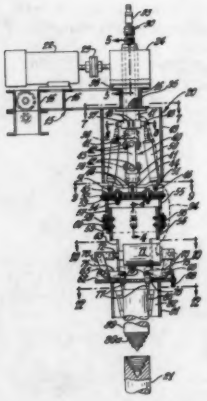
ELECTRODE REPLACEMENT APPARATUS

Charles S. Dunn, Pataskala, and Stephen Seng, Bladensburg, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 26, 1982, Ser. No. 342,672

Int. Cl.³ H05B 7/14

U.S. Cl. 373—92 **14 Claims**



1. In an electrode replacement apparatus wherein successive, vertically aligned electrode sections are inter-connected by relative rotation, each electrode section having complementary male and female threads at its respective ends, and the lower threaded end of a replacement electrode section being threadedly connected to the upper threaded end of the next lower electrode section, the improvements of a vertically oriented feed screw having its axis generally vertically aligned with the axis of said electrode;

means for both rotating said screw about said axis and axially displacing the screw vertically at the pitch of the screw threads, a drive train depending from said screw to be both co-rotatable and axially displaceable therewith;

an electrode-engaging means at the lower end of said drive train for securing a replacement electrode to the drive train for both vertical and rotational displacement with the screw;

the pitch of the screw thread being greater than the pitch of the electrode threads, such that the drive train is lowered by rotation of said screw at a rate faster than said replacement electrode is threaded into the working electrode, and means interposed in said drive train to accommodate relative vertical displacement of said electrode-engaging means and said screw to compensate for such faster lowering of said drive train.

4,420,839

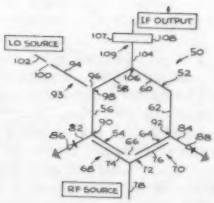
HYBRID RING HAVING IMPROVED BANDWIDTH CHARACTERISTIC

John Hogerheiden, Jr., Camarillo, Calif., assignor to Bunker Ramo-Eltra Corporation, Westlake Village, Calif.

Filed Mar. 30, 1982, Ser. No. 363,634

Int. Cl.³ H04B 1/26; H01P 5/22

U.S. Cl. 455—327 **8 Claims**



1. A hybrid ring suitable for use as a mixer to develop an intermediate frequency (IF) output signal in response to a radio frequency (RF) input signal and a local oscillator (LO) input signal, said hybrid ring comprising:

a transmission line in the form of a ring having a length substantially equal to six quarter wavelengths at the frequency of said LO signal;

diode means connected to said ring at first and second points spaced by substantially two quarter wavelengths;

said ring comprising first and second quarter wavelength coupled line sections between said first and second points;

each of said first and second coupled line sections including first and second spaced transmission line elements;

said first and second coupled line section first elements having first ends respectively directly connected to said first and second points and having second ends unconnected; and

said first and second coupled line section second elements

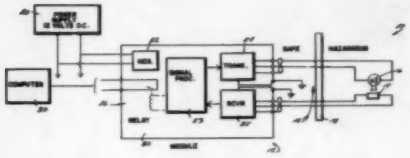
having first ends unconnected and second ends directly interconnected to define an RF input signal port.

4,420,840

INTRINSICALLY SAFE PHOTOELECTRIC SENSING

Thomas R. Livermore, 2283 Manor Ct., Clearwater, Fla. 33515

Filed Aug. 17, 1981, Ser. No. 293,339
Int. Cl.³ H04B 9/00
U.S. Cl. 455—606 **14 Claims**



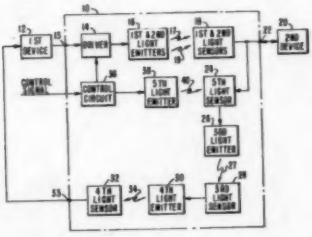
1. An intrinsically safe sensing system comprising:
- a photoelectric sensing means including a photoelectric transmitter and a photoelectric receiver;
- circuitry means for operatively interconnecting said photoelectric sensing means to a power source, said circuitry means including electrical barrier means for limiting the energy to said sensing means to a safe level;
- electrical cable interconnecting means extending between said photoelectric sensing means and said circuitry means, said interconnecting means being long enough to provide for positioning of said sensing means in a hazardous area, and positioning of said circuitry means in a safe area; and
- wherein said circuitry means is provided in a single module located in a safe area.

4,420,841

OPTICALLY COUPLED BIDIRECTIONAL TRANSCEIVER

Allan A. Dudash, Raleigh, NC, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1981, Ser. No. 268,223
Int. Cl.³ H04B 9/00
U.S. Cl. 455—607 **10 Claims**



1. A transceiver providing bidirectional optically isolated communication between a first device having input and output means for producing a first signal at the output means thereof, and a second device having input and output means for producing a second signal at the output means thereof, said transceiver comprising:
- driver means having first and second input terminals and an output terminal, and wherein said first input terminal is responsive to said first signal;
- first and second light emitter devices, said first and said second light emitter devices connected to said output terminal of said driver means;
- first and second light sensor devices in optical communication with said first and said second light emitter devices respectively, wherein said input means of said second device is connected to said first and said second light sensor devices, such that said first and said second light emitter devices and said first and said second light sensor devices provide parallel optical data links for transmitting said first signal from said first device to said second device;
- a third light emitter device having an input terminal;
- a third light sensor device in optical communication with said third light emitter device;
- a fourth light emitter device electrically connected to said third light sensor device;
- a fourth light sensor device in optical communication with said fourth light emitter device, wherein said input means of said first device is connected to said fourth light sensor device, such that said third and said fourth light emitter devices and said third and said fourth light sensor devices provide series optical data links for transmitting said second signal from said second device to said first device;
- means for producing a control signal having a first and a second state;

and

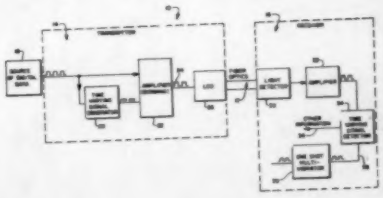
- switching control means having first and second input terminals and first and second output terminals, wherein said first input terminal of said switching control means is responsive to said control signal, and wherein said second input terminal of said switching control means is responsive to said second signal, and wherein said first output terminal of said switching control means is connected to said second input terminal of said driver means, and wherein said second output terminal of said switching control means is connected to said input terminal of said third light emitter device, such that when said control signal is in said first state said first and said second light emitter devices are enabled, via said driver means, to transmit said first signal from said first device to said second device and said third light emitter device is disabled to prevent transmission of said second signal from said second device to said first device, and such that when said control signal is in said second state said first and said second light emitter devices are disabled to prevent transmission of said first signal from said first device to said second device and said third light emitter device is enabled and said second signal is coupled from said second input terminal of said switching control means to said input terminal of said third light emitter device, via said second output terminal of said switching control means, to transmit said second signal from said second device to said first device, thereby providing bidirectional optically isolated communication between said first and said second devices.

4,420,842

FIBER OPTIC DIGITAL DATA TRANSMITTING SYSTEM

Loughrey R. Kuhn, 950 Norwood Rd., Silver Spring, Md. 20904

Filed Jul. 29, 1981, Ser. No. 288,111
Int. Cl.³ H04B 9/00
U.S. Cl. 455—608 **4 Claims**



1. A transmitter for use in a digital data transmitting system

having a transmitter, an optical transmission medium and a receiver comprising:

(a) means for producing a time varying signal which is time coincident with the non-zero amplitude levels of a digital signal having zero and non-zero amplitudes, the time varying signal being used to encode at least the occurrence of the non-zero digital amplitudes of the digital signal;

(b) means for combining two input signals into a time coincident composite output signal, the first input signal being from a source of a digital signal which is to be transmitted, and the second input signal being from the means for producing the time varying signal;

(c) means coupled to the means for combining for producing an optical signal varying in amplitude in accordance with the composite signal;

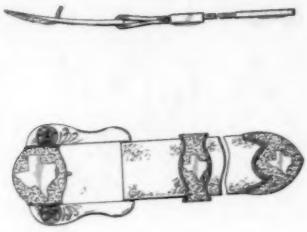
(d) means by which the time varying signal encodes the occurrence of the non-zero digital amplitudes and additional information; and

(e) wherein the time varying signal is a series of time varying signals of a single frequency which are separated by zero amplitude levels, at the non-zero amplitude level of the digital signal.

DESIGNS

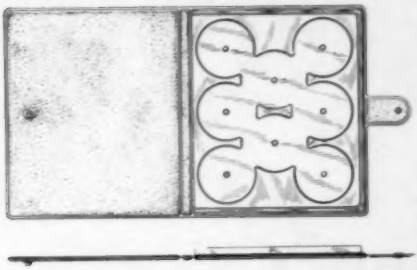
DECEMBER 13, 1983

271,724
BELT
Quenton T. Elliott, 3218 Sackett, Houston, Tex. 77098, and Quenton T. Elliott, Jr., 4516 Holt, Bellaire, Tex. 77401
Filed Jul. 27, 1981, Ser. No. 287,280
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—385

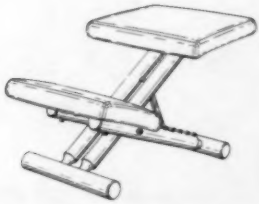


271,725
BRIEF CASE WITH RECESSED HANDLE
Stephen M. Sherer, 71-519 Biskra Rd., Rancho Mirage, Calif. 92270
Filed Feb. 4, 1980, Ser. No. 118,565
Term of patent 7 years
Int. Cl. D3—*01*
U.S. Cl. D3—73

271,726
STORAGE TRAY FOR PRINTWHEELS
Craig D. Drake, Muscatine, Iowa, assignor to Ring King Visibles, Inc., Muscatine, Iowa
Filed Feb. 19, 1982, Ser. No. 350,340
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—74

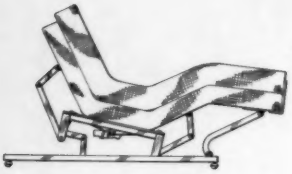


271,727
CHAIR
Peter Opsvik, Hoegtunveien 12, 1370 Asker, Norway
Filed Sep. 1, 1981, Ser. No. 298,480
Claims priority, application Norway, Mar. 2, 1981, 61776
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—17

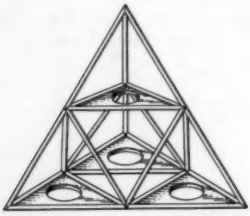


271,728
ROCKING CHAIR
David W. Burns, Rte. 2, Box 370, Charles City, Va. 23030
Filed Oct. 5, 1981, Ser. No. 308,605
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49

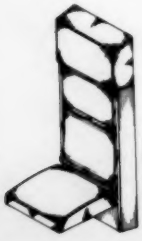
271,729
ADJUSTABLE BED
Richard W. Dodrill, 4235 Country Club Dr., Long Beach, Calif. 90807
Filed Jun. 2, 1981, Ser. No. 269,481
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—84



271,730
SUPPORT FOR POTS OR THE LIKE
Richard J. Wall, 3155 Durham Rd., Hamburg, N.Y. 14075
Filed Sep. 22, 1980, Ser. No. 189,225
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—113



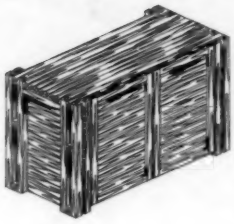
271,731
FOLDING WALL-MOUNTED SEAT
Michael J. Chamberlain, Lynnwood; David R. Myers, and Donald R. Furlong, both of Kirkland, all of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Sep. 30, 1981, Ser. No. 307,175
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—114



271,732
FOLDABLE DISPLAY PANEL
Willy Ytter, Stockholm, Sweden, assignor to Extraversion, Inc., Del.
Filed Jul. 9, 1979, Ser. No. 55,997
The portion of the term of this patent subsequent to Apr. 3, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—139

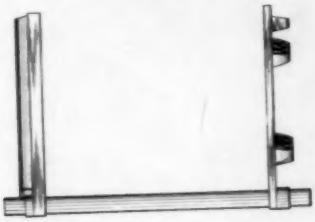
271,733
MOBILE STORAGE UNIT
Roger Daventry, Unit 13, 531 Hay St., Subiaco, 6008, Western Australia, Australia
Filed Nov. 6, 1980, Ser. No. 206,942
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—166

271,734
CABINET
Robert V. Thompson, 75th Ave. North, Myrtle Beach, Calif. 29577
Filed Apr. 23, 1981, Ser. No. 256,800
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—167

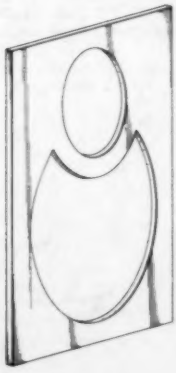


271,735
DISPLAY CASE
Frank W. Brittner, Pittsburgh, Pa., assignor to J & J Snack Food Corp., Pennsauken, N.J.
Filed May 21, 1981, Ser. No. 265,729
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—172

271,736
COMBINED BOOKRACK AND HOLDER FOR WRITING IMPLEMENTS AND COINS
Bruce A. Hehn, St. Clairsville, Ohio, assignor to Alpha Enterprises, Inc., Canton, Ohio
Filed Jul. 9, 1981, Ser. No. 281,664
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—184



271,737
IMAGE FRAME
Joel C. Huck, P.O. Box 42230, Houston, Tex. 77042
Filed Dec. 21, 1981, Ser. No. 332,805
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234



271,738
FORK OR SIMILAR ARTICLE OF FLATWARE
Richard Cragin, Warwick, R.I., assignor to Textron Inc., Providence, R.I.
Filed Nov. 20, 1981, Ser. No. 323,270
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

271,739
SPOON
Vivienne D. Jagger, St. Ives, Australia, assignor to Little People Limited, Hong Kong, Hong Kong
Filed Aug. 27, 1981, Ser. No. 296,916
Claims priority, application United Kingdom, Mar. 18, 1981, 999511
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—151

271,740
VERTICALLY ADJUSTABLE CANTILEVERED GRILL
Keith B. Borglum, 218 Loma, Waterloo, Iowa 50701
Filed Aug. 24, 1981, Ser. No. 295,865
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—332

271,741
SOLDERING IRON TIP
Ronald Riccio, Hermosa Beach, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed Feb. 2, 1981, Ser. No. 230,641
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30

271,742

STAPLE EXTRACTING INSTRUMENT

Lehmann K. Li, Fairfield, Conn., and Reinhart Butter, Columbus, Ohio, assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 9, 1981, Ser. No. 241,864

Term of patent 14 years

Int. Cl. D8—*05;* D24—*02*

U.S. Cl. D8—48

271,743

LID MOVEMENT DAMPING DEVICE OR THE LIKE

Nobuaki Omata, Hiroshima, Japan, assignor to Nifco Inc., Yokohama, Japan

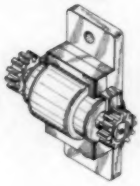
Filed Aug. 17, 1981, Ser. No. 293,532

Claims priority, application Japan, Mar. 5, 1981, 56-8638

Term of patent 14 years

Int. Cl. D8—*99*

U.S. Cl. D8—400



271,744

LID MOVEMENT DAMPING DEVICE OR THE LIKE

Nobuaki Omata, Hiroshima, Japan, assignor to Nifco, Inc., Yokohama, Japan

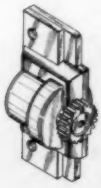
Filed Aug. 18, 1981, Ser. No. 294,075

Claims priority, application Japan, Mar. 5, 1981, 56-8636

Term of patent 14 years

Int. Cl. D8—*99*

U.S. Cl. D8—400



271,745

LID MOVEMENT DAMPING DEVICE OR THE LIKE

Nobuaki Omata, Hiroshima, Japan, assignor to Nifco Inc., Yokohama, Japan

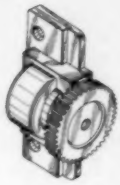
Filed Aug. 18, 1981, Ser. No. 294,076

Claims priority, application Japan, Mar. 5, 1981, 56-8637

Term of patent 14 years

Int. Cl. D8—*99*

U.S. Cl. D8—400



271,746

CONTAINER FOR LIQUIDS

Toby L. Pieri, Chaska, Minn., assignor to Minnetonka, Inc., Minnetonka, Minn.

Filed Mar. 24, 1981, Ser. No. 247,164

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—337

271,747

BOTTLE

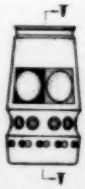
Yukio Kanise, Tokyo, Japan, assignor to Yakult Honsha Co., Ltd., Japan

Filed Apr. 30, 1981, Ser. No. 259,147

Term of patent 14 years

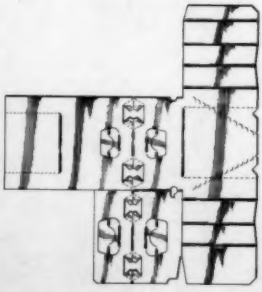
Int. Cl. D9—*01*

U.S. Cl. D9—349



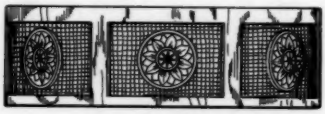
271,748
DISPENSING CONTAINER FOR LIQUIDS
John W. McDonald, Parkville, and John M. B. Ford, Lee's Summit, both of Mo., assignors to Realex Corporation, Kansas City, Mo.
Division of Ser. No. 245,634, Mar. 19, 1981. This application Feb. 16, 1983, Ser. No. 467,142
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—376

271,749
ARTICLE CARRIER BLANK
Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Aug. 28, 1981, Ser. No. 297,150
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433



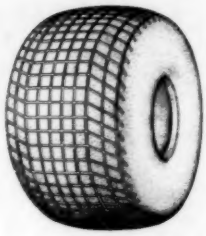
271,750
JAR CAP
Ernest J. Karosi, Ashford, Conn., assignor to Textron Inc., Providence, R.I.
Filed Jul. 6, 1981, Ser. No. 280,810
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D9—436

271,751
FLORAL CONTAINER
Alfred Campana, Bal Harbour, Fla., assignor to Florists' Transworld Delivery Association, Southfield, Mich.
Filed Sep. 25, 1981, Ser. No. 305,708
Term of patent 14 years
Int. Cl. D11—*02*; D7—*01*
U.S. Cl. D11—151



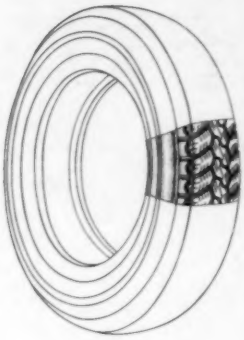
271,752
FIGURINE OF A COLLIE PUP
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Co., Inc., Laguna Hills, Calif.
Filed Dec. 17, 1979, Ser. No. 104,697
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

271,753
TIRE
Robert L. Newton, Lakeville, Ind., assignor to Hoosier Racing Tire Corporation, Lakeville, Ind.
Filed Dec. 28, 1981, Ser. No. 334,578
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—140

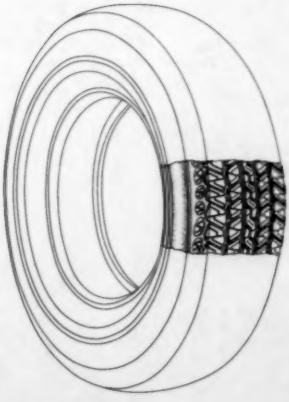


271,754
TIRE TREAD AND BUTTRESS
Lawrence G. Jansen, Akron; Beale A. Robinson, North Canton; Terrence M. Ruip, Uniontown, and John C. Struhsaker, Barberton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Nov. 2, 1981, Ser. No. 316,723
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

271,755
TIRE
Joel Ricquet, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Nov. 10, 1981, Ser. No. 319,883
Claims priority, application France, May 12, 1981, 51
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



271,756
TIRE
Jean-Philippe Gorez, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jan. 27, 1982, Ser. No. 343,195
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



271,757

CAP FOR THE BED OF A PICKUP TRUCK

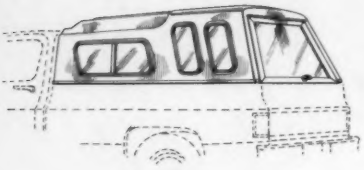
William A. Miller, Rogersville, Mo., assignor to Custom Craft Pickup Covers Corporation, Rogersville, Mo.

Filed Aug. 13, 1981, Ser. No. 292,722

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—156



271,758

BICYCLE MOUNTED CARRYING CASE

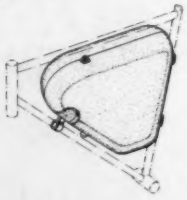
Dennis L. Ervin, 130 Eastwind St., #6, Marina del Rey, Calif. 90291

Filed Aug. 17, 1981, Ser. No. 293,601

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—158



271,759

CARRIER RACK FOR BICYCLES

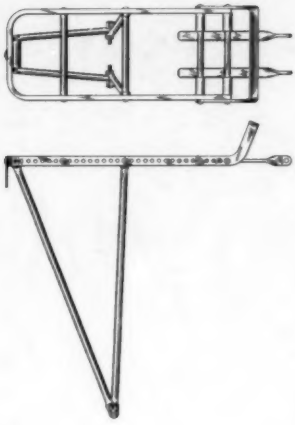
Thomas C. Patterson, Westport, and David L. Campbell, Norwalk, both of Conn., assignors to Cannondale Corporation, Georgetown, Conn.

Filed Oct. 13, 1981, Ser. No. 310,762

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—158



271,760

FRONT FACE OF A VEHICLE WHEEL

Gert Zimmermann, and Andreas Langenbeck, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

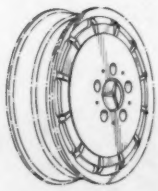
Filed Feb. 18, 1981, Ser. No. 235,600

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1980, 5178

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—209

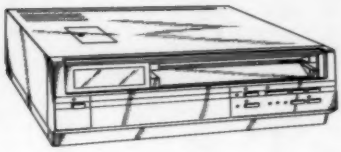


271,761

VIDEO DISC PLAYER

Minoru Hashimoto, Ibaraki; Yoshiyuki Nomura, Hirakata, and Masayoshi Kubo, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 15, 1981, Ser. No. 274,003
Claims priority, application Japan, Dec. 17, 1980, 55-52893
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—1

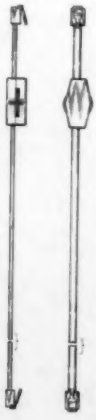


271,762

TELEPHONE SWITCH-CONNECTOR ASSEMBLY

Frank B. Manning, Boston; Peter R. Kramer, Cambridge, both of Mass., and T. Pat Manning, St. Peters, Mo., assignors to Zoom Telephonics, Inc., Boston, Mass.

Filed Jan. 14, 1981, Ser. No. 224,913
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59

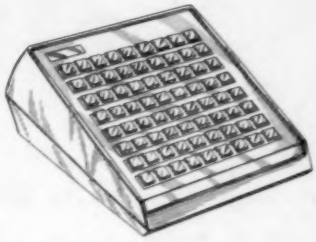


271,763

DIRECT STATION SELECTION CONSOLE

Wilbert C. Brown, Fairfield, and Roman F. Pomponi, Norwalk, both of Conn., assignors to TIE/Communications, Inc., Shelton, Conn.

Filed Jan. 21, 1980, Ser. No. 113,999
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66



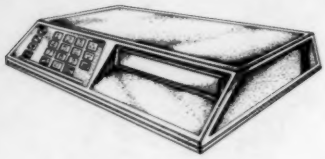
271,764

PORTABLE TWO-WAY RADIO OR SIMILAR ARTICLE

Richard J. Toth, Boca Raton, and John A. Eckmann, Pompano Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 12, 1981, Ser. No. 292,307
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

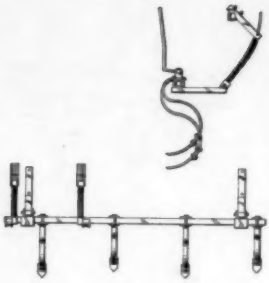
271,765
CABLE TELEVISION SET TOP CONVERTER CONTROL TERMINAL OR THE LIKE
Svein T. Nordberg, El Paso, Tex., assignor to GTE Products Corporation, Stamford, Conn.
Filed Sep. 11, 1981, Ser. No. 301,173
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—77



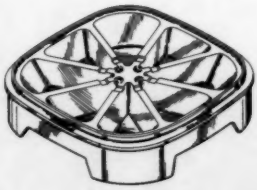
271,766
PORTABLE RADIO WHIP ANTENNA OR SIMILAR ARTICLE
John A. Eckmann, Pompano Beach, and Bruce A. Claxton, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 19, 1981, Ser. No. 275,095
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—86

271,767
ELECTRONIC KEYBOARD
Yoshihisa Ohie, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Aug. 20, 1981, Ser. No. 294,427
Claims priority, application Japan, Feb. 24, 1981, 56-7577
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—100

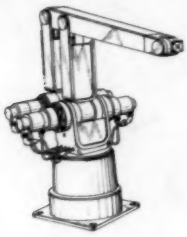
271,768
CULTIVATOR
John E. Sommerfeld, Litchfield, Minn., assignor to Fabridyne, Inc., Litchfield, Minn.
Filed Jun. 15, 1981, Ser. No. 273,402
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—27



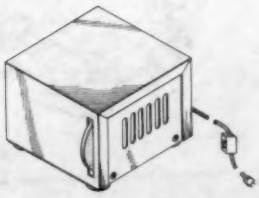
271,769
ICE CUBE TRAY
Robert H. C. M. Daenen, Hekelgem, Belgium, and Erik Herlow, Tikob, Denmark, assignors to Dart Industries Inc., Northbrook, Ill.
Filed Sep. 17, 1981, Ser. No. 280,855
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—90



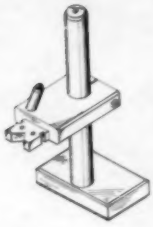
271,770
INDUSTRIAL ROBOT
Michinaga Kono; Yoshio Matsumoto, both of Yokohama; Hirosuke Katsumi, Tokyo, and Fumio Fukuchi, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Division of Ser. No. 137,492, Apr. 4, 1980, Pat. No. Des. 268,587. This application Sep. 30, 1982, Ser. No. 428,977
Claims priority, application Japan, Oct. 5, 1979, 54-41673; Feb. 12, 1980, 55-4391; Mar. 26, 1980, 55-11412
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—122



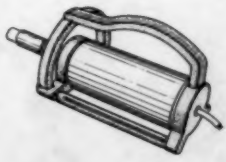
271,771
FISH HOOK SHARPENER
Darrell J. Lehmann, 2033 Cap Rock, Richardson, Tex. 75080
Filed Mar. 12, 1981, Ser. No. 243,186
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—125



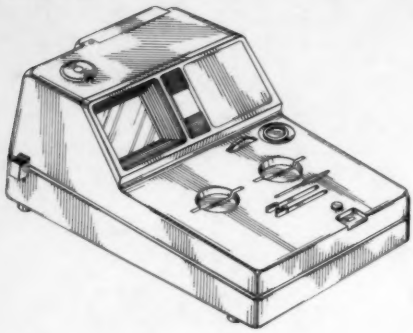
271,772
GRINDING FIXTURE
Timothy E. Grohowski, R.F.D. #1, George Washington Turnpike, Burlington, Conn. 06013, and Randall W. Wheeler, 20 Walnut Dr., Hebron, Conn. 06248
Filed Mar. 20, 1981, Ser. No. 245,951
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—140



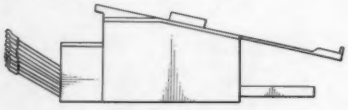
271,773
POKER VIBRATOR ELECTRIC DRIVE UNIT
Bo Ekelund, Enebyberg, Sweden, assignor to Dynapac Maskin AB, Solna, Sweden
Filed Jul. 17, 1981, Ser. No. 284,338
Claims priority, application Sweden, Jan. 19, 1981, 81-0088
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—147



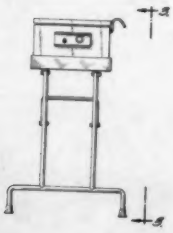
271,774
PHOTOGRAPHIC ENLARGING APPARATUS
Florian Vikoler, Brixen, Italy, assignor to Durst A.G. Fabrik Fototechnischer Apparate, Bozen, Italy
Filed Dec. 14, 1981, Ser. No. 330,394
Claims priority, application Italy, Jul. 15, 1981, 6713/81[U]
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—25



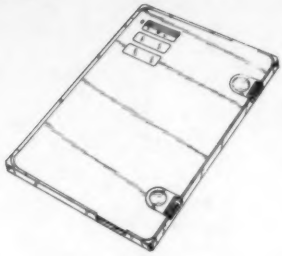
271,775
COPYING AND SORTING APPARATUS
R. Clark DuBois, Fairfield, and John C. Hamma, Bridgeport, both of Conn., assignors to Gradco/Dendoki, Inc., Santa Ana, Calif.
Filed Feb. 5, 1981, Ser. No. 231,803
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



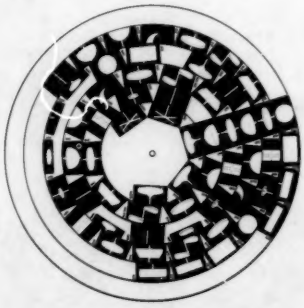
271,776
EXPOSURE UNIT FOR LITHOGRAPHIC PLATES
Gerold Litschi, Lansdale, Pa., assignor to Master Etching Machine Company, Ambler, Pa.
Filed Sep. 14, 1981, Ser. No. 302,206
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D16—33



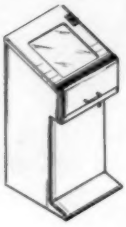
271,777
X-RAY FILM CASSETTE
Norbert Schlagheck, Fuerstenfeldbruck, and Lutz Rabold, Soecking, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Sep. 8, 1980, Ser. No. 184,894
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 5MR582
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—34



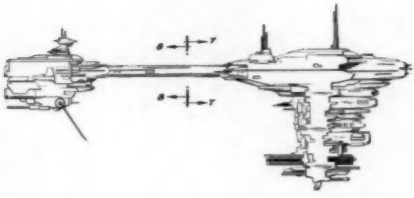
271,778
VISUALIZATION DISC FOR SELECTING ELEMENTS OF DISPLAY STANDS
Pierre H. G. Mabille, and Yannick A. R. Perrin, both of Paris, France, assignors to Applications Industrielles et Artistiques des Matieres Plastiques Apia, Paris, France; Formtechnik, Furth, Fed. Rep. of Germany and Pop Crafts, Hertfordshire, England
Filed Aug. 28, 1981, Ser. No. 297,202
Claims priority, application France, Mar. 2, 1981, 810753
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—64



271,779
NEWSPAPER VENDOR
Peter Ostermann, 1111 Polk Ave., Sunnyvale, Calif. 94086
Filed Aug. 17, 1981, Ser. No. 293,487
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D20—6

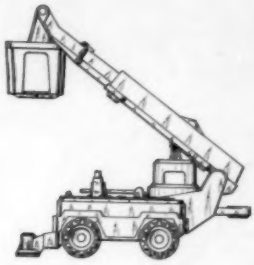


271,780
TOY SPACE VEHICLE
George W. Lucas, Jr., San Anselmo; Joseph E. Johnston, Fairfax, and Nilo Rodis-Janero, San Jose, all of Calif., assignors to Lucasfilm, Ltd., North Hollywood, Calif.
Filed May 4, 1981, Ser. No. 260,469
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87



271,781
GUM MACHINE
David Galoob, 90 Beachmont Dr., San Francisco, Calif. 94132
Filed Nov. 23, 1981, Ser. No. 324,069
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—109

271,782
TOY CRANE
Akira Takasaka, and Tetsuo Ohkado, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jun. 19, 1981, Ser. No. 275,581
Claims priority, application Japan, Sep. 9, 1980, 55-37160
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—135

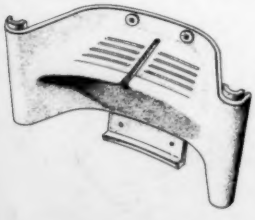


271,783
GOLF CLUB PUTTER HEAD
Samuel P. Simmons, Torrance, Calif., assignor to Sigma Diversified Sports, Inc., Torrance, Calif.
Filed Aug. 27, 1981, Ser. No. 296,622
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—217

271,784
GOLF CLUB HEAD
Margaret Caskey, and Doyle D. Jernigan, both of Temple, Tex., assignors to Wood-Arts Company, Inc., Temple, Tex.
Filed Mar. 27, 1980, Ser. No. 248,521
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—220

271,785
PLAYGROUND EQUIPMENT LADDER
Gerald Beekenkamp, 4115 Rolling Valley Dr., Erin Mills, Ontario, and Donald Curtis, R.R. #2, Paris, Ontario, both of Canada
Filed Mar. 11, 1982, Ser. No. 357,321
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—244

271,786
PLAYGROUND EQUIPMENT STEP
Gerald Beekenkamp, 4115 Rolling Valley Dr., Erin Mills, Ontario, and Donald Curtis, R.R. #2, Paris, Ontario, both of Canada
Filed Oct. 28, 1981, Ser. No. 316,066
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—245

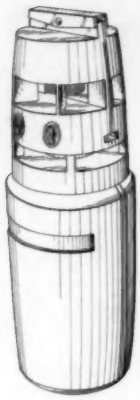


271,787
AMMO POUCH
Randall B. Finley, 362 S. 100 W., Orem, Utah 84057
Filed Oct. 5, 1981, Ser. No. 308,352
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—14

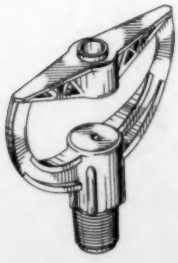
271,788
LEAD RELEASE FOR FISHING WITH FLY ROD
Harry W. Hite, P.O. Box 961, Puyallup, Wash. 98371
Filed Jun. 10, 1980, Ser. No. 158,115
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

271,789
HATCH COVER WITH PNEUMATIC SEAL FOR MOBILE OR STATIONARY STORAGE TANKS
Carl L. Hardee, and Robert E. Wagner, both of Ottawa, Ill., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.
Filed Jun. 2, 1981, Ser. No. 269,928
Term of patent 14 years
Int. Cl. D23—*01;* D12—*03*
U.S. Cl. D23—2

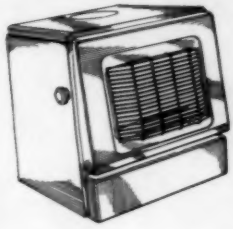
271,790
WIND CONTROLLED SPRAYER UNIT
Thomas Aldrich, Spring Valley, N.Y., assignor to Thermo-Tech Corp., Manchester, N.H.
Filed Jan. 16, 1981, Ser. No. 225,619
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



271,791
IRRIGATION SPRAY NOZZLE
Mark Healy, Orange County, Fla., assignor to Senninger Irrigation, Inc., Orlando, Fla.
Filed Feb. 11, 1981, Ser. No. 233,504
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

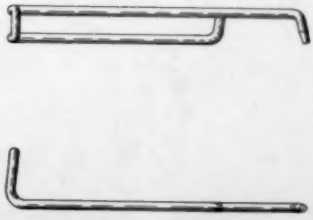


271,792
SOLID FUEL HEATER
John N. Stancliffe, Allestree, England, assignor to T. I. Domestic Appliances Limited, London, England
Filed May 23, 1980, Ser. No. 152,777
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

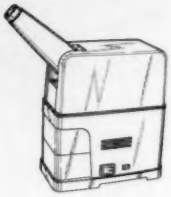


271,793
AIR CONTROL CHECK UNIT FOR FIREPLACES AND THE LIKE
Byron D. Lane, 212 16th Ave. S.W., Minot, N. Dak. 58701
Filed May 8, 1981, Ser. No. 262,023
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127

271,794
HANDLE AND COAL GRATE SHAKER
Thomas C. Wenzel, 34 Smith St., Greenlawn, N.Y. 11740
Filed Oct. 9, 1981, Ser. No. 309,993
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D23—138.2



271,795
VAPORIZER
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Kazuo Nagata, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Jun. 30, 1981, Ser. No. 279,278
Claims priority, application Japan, Feb. 27, 1981, 56-7857
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—148

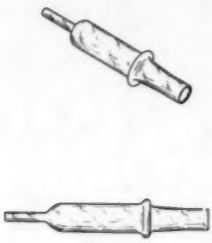


271,796
DISPOSABLE STAPLE CARTRIDGE FOR LINEAR CLOSURE SURGICAL STAPLER
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Jul. 2, 1981, Ser. No. 279,682
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—27

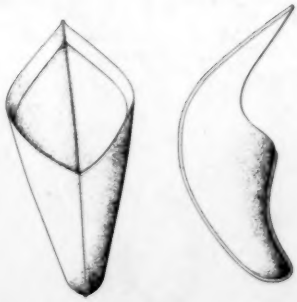
271,797
NIPPLE FOR A SCREW CAP BOTTLE
Anthony Chrones, Warwick, R.I., assignor to Gerber Products Company, Fremont, Mich.
Filed Dec. 12, 1980, Ser. No. 215,746
The portion of the term of this patent subsequent to May 11, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—46

271,798
PREMATURE NIPPLE OR THE LIKE
Antonino Araujo, Jr., Columbus, Ohio, assignor to Abbott Laboratories, North Chicago, Ill.
Filed Mar. 4, 1981, Ser. No. 240,527
Term of patent 14 years
Int. Cl. D24—*05*
U.S. Cl. D24—46

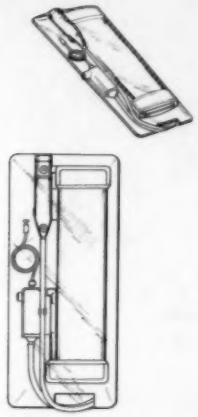
271,799
URINE COLLECTING DEVICE FOR MEN
Ian Atkins, Bålstad, Sweden, assignor to Nolato AB, Torekov, Sweden
Filed Feb. 27, 1981, Ser. No. 238,714
Claims priority, application Sweden, Sep. 4, 1980, 80-1658
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—51



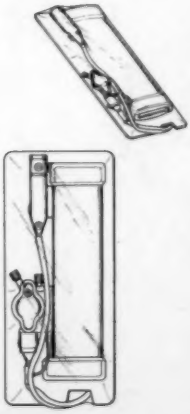
271,800
MALE INCONTINENCE PAD
Lennart I. Brendling, Järfälla, Sweden, assignor to Landstingens Inkopscentral, Lic, Solna, Sweden
Filed Apr. 8, 1981, Ser. No. 252,256
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



271,801
ARTIFICIAL KIDNEY ASSEMBLY PACKAGE WITH ATTACHED BLOOD PUMP AND MULTIFUNCTIONAL SUBASSEMBLY
Andreas Preussner, Berkeley, Calif., assignor to Cordis Dow Corp., Miami, Fla.
Filed May 26, 1981, Ser. No. 266,695
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—51



271,802
ARTIFICIAL KIDNEY ASSEMBLY PACKAGE WITH ATTACHED BLOOD PUMP AND MULTIFUNCTIONAL SUBASSEMBLY
Andreas Preussner, Berkeley, Calif., assignor to Cordis Dow Corp., Miami, Fla.
Filed May 26, 1981, Ser. No. 266,868
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—51

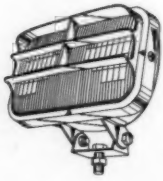


271,803
CONTAINER FOR MEDICAL LIQUIDS
Mark E. Larkin, Lindenhurst; Edward S. Tripp, Grayslake, and John S. Ziegler, Arlington Heights, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Dec. 12, 1980, Ser. No. 215,942
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—58

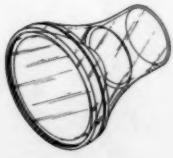
271,804
BOTTLE FOR RETAINING BLOOD
George S. Momoda, Mission Viejo, Calif., assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 15, 1981, Ser. No. 254,217
Term of patent 14 years
Int. Cl. D24—*99;* D9—*01*
U.S. Cl. D24—56

271,805
CONTAINER FOR MEDICAL LIQUIDS
Mark E. Larkin, Lindenhurst; Edward S. Tripp, Grayslake, and John S. Ziegler, Arlington Heights, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Dec. 12, 1980, Ser. No. 215,943
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—58

271,806
FOG LIGHT
Hisao Yabata, Tamamura, Japan, assignor to Ichikawa Press Industry Co., Ltd., Takasaki, Japan
Filed Aug. 27, 1981, Ser. No. 296,707
Claims priority, application Japan, May 27, 1981, 56-22633
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—29

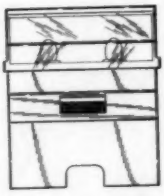


271,807
FLASHLIGHT HEAD
Knut O. Sassmannshausen, Rothenbach St., D6580 Idar-Oberstein, Fed. Rep. of Germany
Division of Ser. No. 917,012, Jun. 16, 1978, Pat. No. Des. 259,962. This application Mar. 10, 1981, Ser. No. 242,382
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1977, 1460
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—37

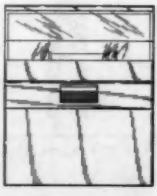


271,808
FLASHLIGHT
Hoyt W. Axton, Tahoe City, and Corey B. Bailey, Lake View Terrace, both of Calif., assignors to Sierra Survival Company, Inc., Ada, Okla.
Filed Jun. 15, 1981, Ser. No. 273,453
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—37

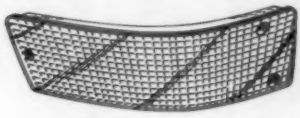
271,809
FLASHLIGHT
Hoyt W. Axton, Tahoe City, and Corey B. Bailey, Lake View Terrace, both of Calif., assignors to Sierra Survival Company, Inc., Ada, Okla.
Filed Jun. 15, 1981, Ser. No. 273,483
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—37



271,810
FLASHLIGHT
Hoyt W. Axton, Tahoe City, and Corey B. Bailey, Lake View Terrace, both of Calif., assignors to Sierra Survival Company, Inc., Ada, Okla.
Filed Jun. 15, 1981, Ser. No. 273,990
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—37



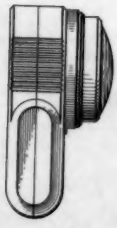
271,811
SIGNAL LAMP LENS FOR AUTOMOBILE
Claus Luthe, Munich; Manfred Rennen, Ingolstadt, and Hans Braun, Lohhof, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Mar. 27, 1981, Ser. No. 248,364
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, MR 12 271
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—122



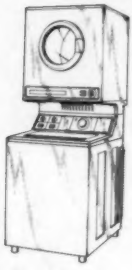
271,812
COMBINATION SLIDING DOOR AND RAIL COVER
Jan J. G. Markus, Krimpen, Netherlands, assignor to Markus Hermetische Deuren B.V., Netherlands
Filed Feb. 23, 1981, Ser. No. 238,218
Claims priority, application Benelux, Aug. 21, 1980, 54934-02
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48

271,813
RAZOR
Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Mar. 8, 1982, Ser. No. 356,136
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46

271,814
ELECTRIC SHAVER
Takeshi Takagi, Neyagawa; Shinji Yamamoto, and Keiji Kuribayashi, both of Hirakata, all of Japan, assignors to Matsushita Electric Works, Osaka, Japan
Filed Oct. 15, 1981, Ser. No. 311,602
Claims priority, application Japan, Apr. 30, 1981, 56-19038
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—50



271,815
COMBINED ELECTRIC WASHER AND CLOTHES DRYER
Takao Oosawa, Tokyo; Joji Nishiyama, Kodaira; Hajime Kasai, Funabashi, and Etsuro Hirose, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 21, 1981, Ser. No. 332,936
Claims priority, application Japan, Jun. 26, 1981, 56-27704; Jun. 26, 1981, 56-27705
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D32—6



271,816
VACUUM HEAD FOR CLEANING UNDERWATER SURFACES
Kenneth E. Price, 1534 Channelwood Dr., Whittier, Calif. 90601
Filed Nov. 10, 1980, Ser. No. 205,873
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—32

271,817
SPONGE
Pierre Collin, Paris, France, assignor to Spontex Société Anonyme, Paris, France
Filed Jun. 4, 1980, Ser. No. 156,382
Claims priority, application France, Dec. 11, 1979, 78 103
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—40

271,818
TRASH CAN COVER
Robert G. Hartman, Greensboro, N.C., assignor to Zarn, Inc., Reidsville, N.C.
Filed Feb. 4, 1981, Ser. No. 231,435
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D34—11

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF DECEMBER, 1983

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Abbott Laboratories: *See*—
Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., 4,420,568., Cl. 436-536.000.

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Abe, Yoshio: *See*—
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Achtnig, Klaus-Peter: *See*—
Forberg, Horst; Radelow, Wolfgang; Achtnig, Klaus-Peter; and Muller, Manfred, 4,420,200., Cl. 339-13.000.

Ackermann, Rolf; Jung, Friedrich; Mauer, Egon; and Rupertinger, Hermann, to Triumph-Adler A.G. fur Buro- und Informationstechnik. Device for lifting the printing head off the platen. 4,420,269., Cl. 400-356.000.

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Aiba, Seiichi; Hiratani, Kazuhisa; and Nakagawa, Tsutomu, to Director Genereal of Agency of Industrial Science & Technology. Catalyst membrane. 4,420,612., Cl. 536-102.000.

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Becker, Bernard B.; Bowman, John K.; and Randall, Cyril A., 4,420,010., Cl. 137-116.000.

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Ledbetter, James A., 4,420,211., Cl. 339-98.000.

Belikov, Viktor T.; Ivlev, Anatoly D.; Sitnichenko, Valentin M.; Shvets, Vladimir I.; and Bushtian, Leonid V., to Odessky Ordena Trudovogo Kraskogo. Electric drive for synchronous displacement of mechanically independent machine assemblies moving along equidistant trajectories. 4,420,712., Cl. 318-41.000.

Belkin, German S.; Voskresensky, Stal N.; Kiselev, Viktor Y.; Lukatskaya, Ida A.; Rodionov, Valery V.; Skurikhin, Mikhail N.; Frolova, Irina B.; Zuev, Vyacheslav S.; Kornevv, Lev I.; Chervonenkis, Rauza A.; Rabinovich, Efim M.; Volkova, Tatyana P.; and Goryaev, German A. Method of preparing contacts and electrodes of electric vacuum apparatuses. 4,420,346., Cl. 148-4.000.

Bell, Allyn R., to Uniroyal, Inc. Synergistic herbicidal composition. 4,420,326., Cl. 71-93.000.

Bell & Howell Company: *See*—
Jacobs, John H., 4,420,772., Cl. 358-294.000.
Mischenko, Nicholas, 4,420,232., Cl. 353-25.000.

Bell Telephone Laboratories, Incorporated: *See*—
Jin, Sungho, 4,420,732., Cl. 335-151.000.
Owen, Brian, 4,420,724., Cl. 330-277.000.
Pirsch, Peter, 4,420,771., Cl. 358-261.000.

Beloit Corporation: *See*—
Dahl, Carl B.; and Crouse, Jere W., 4,420,371., Cl. 162-272.000.

Belov, Valentin V.; and Verkevich, Vsevolod I. Device for remote control an actuator of a shut-off member. 4,420,139., Cl. 251-28.000.

Belt, Kenneth W.; and Mattson, John S., to Norland Corporation. Carrying case for a cardiac pacer. 4,420,078., Cl. 206-305.000.

Bendix Corporation, The: *See*—
Karol, James J.; and Young, Thornton J., 4,420,210., Cl. 339-94.00M.
Riggs, Robert R.; and Hunt, Paulmer D., 4,420,014., Cl. 137-468.000.

Bennett, Robert A. Bellows actuated foam dispenser. 4,420,098., Cl. 222-190.000.

Bergman, Roger M.; Bielecki, Edwin J.; and Nippert, Charles R., Jr., to Cabot Corporation. Pyrohydrolysis of columbium oxyfluoride to columbium oxide. 4,420,469., Cl. 423-592.000.

Bergmann, Ewald: *See*—
Dommer, Hans-Martin; Bareis, Alfred; and Bergmann, Ewald, 4,419,929., Cl. 100-257.000.

Bergner, Dieter; Hannesen, Kurt; Schulte, Wilfried; and Steinmetz, Peter, to Hoechst Aktiengesellschaft. Electrolysis apparatus. 4,420,387., Cl. 204-263.000.

Bernhard, Heinz D.: *See*—
Horoldt, Ernst; Vollmuller, Helmut; Bernhard, Heinz D.; and Strobel, Harald M., 4,420,572., Cl. 523-322.000.

Bernie, Jack, to Process Displays Company. Tab mounted dispenser. 4,420,082., Cl. 206-526.000.

Bertelli, Guido; and Locatelli, Renato, to Montedison S.p.A. Self-extinguishing polyolefin compositions. 4,420,577., Cl. 524-83.000.

Bertolacini, Ralph J.; Mosby, James F.; and Schwartz, John G., to Standard Oil Company (Indiana). Hydrotreating vacuum gas oils with catalyst and added organic fluorine compound. 4,420,388., Cl. 208-112.000.

Bertrams, Josef: *See*—
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860., Cl. 57-22.000.

Besson, Rene; and Bron, Alphonse, to ETA S.A., Fabriques d'Ebauches. Electronic watch with means for detecting the movement of a hand through a reference position. 4,420,263., Cl. 368-80.000.

Beveridge, Lois M.; and LaCoste, Harry. Moisture resistant, quick release pill container. 4,420,076., Cl. 206-37.000.

Beyer, Richard A.: *See*—
DeWilde, Mark A.; and Beyer, Richard A., 4,420,255., Cl. 356-315.000.

Bezchastnov, Gennady A.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701., Cl. 310-54.000.

Bhattacharyya, Bhupati R.; and Ballweber, Edward G., to Nalco Chemical Company. Non-aqueous dispersion polymerization of vinyl monomers. 4,420,586., Cl. 524-769.000.

BICC Limited: *See*—
Lyon, Robert C., 4,419,795., Cl. 24-530.000.

BICC Public Limited Company: *See*—
Dean, Noel S.; Lawton, Kenneth L.; and Yates, Vincent A., 4,420,220., Cl. 350-96.230.

Bielecki, Edwin J.: *See*—
Bergman, Roger M.; Bielecki, Edwin J.; and Nippert, Charles R., Jr., 4,420,469., Cl. 423-592.000.

Bienert, Horst; and Pfisterer, Hermann, to Webasto-Werk W. Baier GmbH & Co. Drive arrangement for a motor-vehicle top with outward-moving sliding cover. 4,420,185., Cl. 296-223.000.

Bihler, Otto; and Augenstein, Reiner, to Otto Bihler Maschinenfabrik GmbH & Co. K.G. Method of forming a cage for frusto-conical roller bearings. 4,419,800., Cl. 29-148.40C.

Bio-Rad Laboratories, Inc.: *See*—
Kuehl, Donald, 4,420,690., Cl. 250-428.000.

Biondi, Dennis P.: *See*—
Leung, Chung W.; Dawson, Robert H.; Blumenfeld, Martin A.; and Biondi, Dennis P., 4,420,503., Cl. 427-85.000.

Bischoff, Hans, to MTU Motoren- und Turbinen-Union GmbH. Device for the reduction of secondary losses in a bladed flow duct. 4,420,288., Cl. 416-244.00A.

Bison-Werke Bahre & Greten GmbH & Co. KG: *See*—
Neubauer, Harry; Greten, Berndt; and Seeger, Gunter, 4,420,357., Cl. 156-274.600.

Black & Decker Inc.: *See*—
Harris, David, 4,419,822., Cl. 30-276.000.

Blake, David L.: *See*—
Arbatsk, David P.; and Blake, David L., 4,420,040., Cl. 166-70.000.

Blaser, Hans U., to SIG-Schweizerische Industrie-Gesellschaft. Installation of an excess pressure valve in a hermetically sealed flexible container. 4,420,015., Cl. 137-852.000.

Blaser, Lee B. Energy efficient housing structure. 4,420,036., Cl. 165-45.000.

Blendax-Werke R. Schneider GmbH & Co.: *See*—
Orlowski, Jan A.; Wagner, Helmar; and Butler, David V., 4,420,306., Cl. 433-228.000.

Blessing, Fritz; Margitics, Gabor; and Brauer, Gerhard, to Novotechnik KG Offterdinger GmbH & Co., Firma. Coupling device for the play-free connection of a precision potentiometer with a movable machine part. 4,420,273., Cl. 403-24.000.

Blickensderfer, John R.; and Pacala, Luba A., to Union Carbide Corporation. Phenolic friction particles. 4,420,571., Cl. 523-149.000.

Bluem, Gary R.: *See*—
Baxter, Kenneth D.; Bluem, Gary R.; Humphrey, Dallas R.; Kittle, Carl E.; and Kluge, Douglas J., 4,419,907., Cl. 74-531.000.

Blumenfeld, Martin A.: *See*—
Leung, Chung W.; Dawson, Robert H.; Blumenfeld, Martin A.; and Biondi, Dennis P., 4,420,503., Cl. 427-85.000.

Boart International, Ltd.: *See*—
Hughes, Robert B., 4,419,979., Cl. 125-11.00R.

BOC Limited: *See*—
Sharp, Derek J.; and Watts, Robert C., 4,420,009., Cl. 137-98.000.

Boden, Richard M.; and Tyszkiewicz, Theodore J., to International Flavors & Fragrances Inc. Process for augmenting or enhancing the aroma of detergents using unsaturated branch chain ketones. 4,420,411., Cl. 252-174.110.

Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., to International Flavors & Fragrances Inc. Methyl substituted-2-oxobexane derivatives and process for preparing and using same. 4,420,423., Cl. 252-522.00R.

Boden, Richard M.; Vock, Manfred H.; and Tyszkiewicz, Theodore J., to International Flavors & Fragrances Inc. Prenyl methyl carbonate and organoleptic uses thereof. 4,420,472., Cl. 424-58.000.

Boge GmbH: *See*—
Husch, Bruno, 4,420,274., Cl. 403-227.000.

Bogenschutz, Thomas M., to General Signal Corporation. Cam lock slack adjuster. 4,420,066., Cl. 188-107.000.

Bohlmann, Volker; and Kania, Norbert, to Sachs-Dolmar GmbH. Arrangement for reducing the suction and/or exhaust noises for rapid speed combustion machines. 4,420,063., Cl. 181-229.000.

Bolgiano, Nicholas C.; and Sigman, William T., to Armstrong World Industries, Inc. Process for providing improved radiation-curable surface coverings and products produced thereby. 4,420,499., Cl. 427-53.100.

Bolhofer, William A.; Cragoe, Edward J.; and Hoffman, Jacob M., Jr, to Merck & Co., Inc. Substituted pyridopyrimidines as gastric secretion inhibitors. 4,420,615., Cl. 544-279.000.

Bolton, Joseph A.; and Dufresne, Louis L., to Albany International Corp. Method and apparatus with couch press for dewatering a slurry of fine particles. 4,420,402., Cl. 210-783.000.

Bomer, Bruno; Suling, Carlhans; Konig, Joachim; Hespe, Hans; Heynemann, Carl; and Weber, Raimund, to Bayer Aktiengesellschaft. Lens of a homo- or copolymer of a fluorine containing styrene polymer. 4,420,225., Cl. 350-409.000.

Bommer Industries, Inc.: *See*—
Prout, Addison S., 4,419,788., Cl. 16-300.000.

Bonga, Benno I., to Ateliers des Charmilles S.A. Helicoidal guide for wire electrode of an EDM apparatus. 4,420,671., Cl. 219-69.00W.

Bonk, Henry W.; Nelb, Robert G., II; and Oertel, Richard W., III, to Upjohn Company, The. Melt-polymerization process for the preparation of thermoplastic polyamides and polyesteramides. 4,420,602., Cl. 528-80.000.

Bonnet, Jean: *See*—
Loyer, Georges; Bonnet, Jean; and Lazzarini, Roger, 4,420,285., Cl. 414-291.000.

Booms, Robert E.; and Holstead, Colin, to Eastman Kodak Company. Photographic silver halide materials. 4,420,556., Cl. 430-549.000.

Borg-Warner Corporation: *See*—
Lutz, Timothy P., 4,420,292., Cl. 418-32.000.

Bosch & Pierburg System oHG: *See*—
Hartel, Gunter; Schurfeld, Armin; and Abidin, Anwar, 4,420,439., Cl. 261-142.000.

Bouquigny, Jean-Claude: *See*—
Lecourtier, Georges; and Bouquigny, Jean-Claude, 4,420,715., Cl. 318-301.000.

Bower, David E., to U.S. Philips Corporation. Acoustic wave devices. 4,420,728., Cl. 333-151.000.

Bowman, John K.: *See*—
Becker, Bernard B.; Bowman, John K.; and Randall, Cyril A., 4,420,010., Cl. 137-116.000.

Braden, Rudolf; and Klauke, Erich, to Bayer Aktiengesellschaft. Process for the preparation of fluorine-substituted carboxylic acid chlorides and their use. 4,420,433., Cl. 260-544.00D.

Brader, Walter H., Jr.: *See*—
Sanderson, John R.; Brader, Walter H., Jr.; and Watts, Lewis W., Jr., 4,420,625., Cl. 549-533.000.

Braid, Milton, to Mobil Oil Corporation. Antioxidant compositions. 4,420,579., Cl. 524-328.000.

Brandt, Inc.: *See*—
Winkler, Theodore; and Reed, Frank J., 4,420,153., Cl. 271-304.000.

Brauer, Gerhard: *See*—
Blessing, Fritz; Margitics, Gabor; and Brauer, Gerhard, 4,420,273., Cl. 403-24.000.

Brauer, Hans-Martin, to Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung. Railway car wheel. 4,420,179., Cl. 295-15.000.

Breen, Thomas B., to General Electric Company. Characteristic timer for a protective relay. 4,420,789., Cl. 361-94.000.

Brenner, Robert A., to Whirlpool Corporation. Valveless liquid pumping agitator for automatic washers. 4,419,870., Cl. 68-18.0FA.

Brentini, Attilio. Fastener device. 4,419,874., Cl. 70-459.000.

Bret, Georges; and Michelet, Guy, to Quantel S.A. Mirror having a variable focal length. 4,420,222., Cl. 350-295.000.

Bretler, Haim: *See*—
Amon, Maurice A.; and Bretler, Haim, 4,420,515., Cl. 428-29.000.

Bridgestone Australia Pty. Ltd.: *See*—
Kreisfeld, Rudolf P., 4,419,844., Cl. 49-475.000.

Briehl, Gerhard, to WGW Westdeutsche Getriebe- und Kupplungswerke GmbH. Torque division gearing connection assembly. 4,419,906., Cl. 74-413.000.

Bright, John H.: *See*—
Savides, Christos; and Bright, John H., 4,420,643., Cl. 568-753.000.

British Petroleum Company Limited, The: *See*—
Roberts, Roy G., 4,420,276., Cl. 405-224.000.

British Petroleum Company p.l.c., The: *See*—
Fogg, Sidney G.; Robertson, Frank C.; and Wilson, Douglas, 4,420,573., Cl. 523-333.000.

Brock Manufacturing, Inc.: *See*—
Kruger, Joseph A., 4,419,851., Cl. 52-184.000.

Broden, David E.; and Martwick, Wilford E., to Honeywell Inc. Method of making spin stabilized discarding sabot projectile. 4,419,796., Cl. 29-1.230.

Brodsky, Mark A.: *See*—
Hodge, Robin H.; and Brodsky, Mark A., 4,420,767., Cl. 357-81.000.

Bron, Alphonse: *See*—
Besson, Rene; and Bron, Alphonse, 4,420,263., Cl. 368-80.000.

Brooks, Robert T., to Baker International Corporation. Valving apparatus for selectively sealing an annulus defined between a work string and the bore of an element of a production string of a subterranean well. 4,420,043., Cl. 166-319.000.

Broweleit, Randall J.: *See*—
Klock, Lawrence E.; and Broweleit, Randall J., 4,420,158., Cl. 273-400.000.

Brown, Herbert L.; and Mayer, Frederick J. Obstruction warning system. 4,420,740., Cl. 340-28.000.

Brown, James W., III: *See*—
Krueger, Spencer M.; and Brown, James W., III, 4,420,555., Cl. 430-507.000.

Brown, Thomas C., Jr. Polyphase braid reinforced hose. 4,420,018., Cl. 138-124.000.

Browning, Alva L. Support gravity measurement instrument. 4,419,891., Cl. 73-382.0OG.

Bruensicke, Wilhelm A., to Lockheed Corporation. Stowable fire suppression system for aircraft cabins and the like. 4,420,047., Cl. 169-53.000.

Bryce, Kenneth L.: *See*—
Herman, Jim T.; Bryce, Kenneth L.; and Lancaster, Gerald M., 4,420,580., Cl. 524-424.000.

BSL Corporation: *See*—
Gidge, Kenneth N.; and Richard, Henry J., 4,420,027., Cl. 160-328.000.

Buchanan, William T.: *See*—
Pocius, Frances C.; and Buchanan, William T., 4,420,463., Cl. 422-266.000.

Bugaut, Andree; and Vandenbossche, Jean-Jacques, to L'Oreal. Metaphenylenediamines. 4,420,637., Cl. 564-443.000.

Buhler, Ulrich; Kindler, Horst; Kuhlein, Klaus; Kallay, Maria; Kosubek, Uwe; Lowenfeld, Rudolf; and Roth, Kurt, to Cassella Aktiengesellschaft. Process for the production of reserve effects on polyester textiles and polyester/cellulose mixed fibre textiles: discharge printing with disperse azo dye with alkyl or alkoxy carbonyl, cyand and hydroxy phenyl group. 4,420,308., Cl. 8-464.000.

Bulenda, Andrzej: *See*—
Skolik, Wojciech; Wodecki, Jozef; Gortat, Zenon; Szyngiel, Stanislaw; Bulenda, Andrzej; and Sopora, Piotr, 4,420,075., Cl. 198-735.000.

Bundrick, Benjamin, Jr. Flexible cylinder-head internal combustion engine with cylinder compression adjustable for use with available fluid fuels. 4,419,969., Cl. 123-48.00R.

Bunker Ramo-Eltra Corporation: *See*—
Hogerheiden, John, Jr., 4,420,839., Cl. 455-327.000.

Burkholder, Ward J., to Goodyear Tire & Rubber Company, The. Separation of resorcinol from non-extractable impurities. 4,420,376., Cl. 203-29.000.

Burns, William K.; and Rashleigh, Scott C., to United States of America, Navy. Dual input gyroscope. 4,420,258., Cl. 356-350.000.

Burroughs Corporation: *See*—
Green, Keith. 4,420,830., Cl. 369-261.000.
Mowry, William H., Jr., 4,420,175., Cl. 283-93.000.
Rau, William G., 4,420,727., Cl. 331-65.000.

Bursky, Vyacheslav A.: *See*—
Rubanov, Alexandr S.; Tanin, Leonid V.; Vasilieva, Ljudmila V.; Kalinin, Anatoly N.; Bursky, Vyacheslav A.; and Vidmant, Felix V., 4,420,218., Cl. 350-3.850.

Bush, Darrell C.; and Jenkins, Ralph E., to Core Laboratories, Inc. Particle measuring apparatus. 4,419,879., Cl. 73-432.0PS.

Bushtian, Leonid V.: *See*—
Belikov, Viktor T.; Ivlev, Anatoly D.; Sitnichenko, Valentin M.; Shvets, Vladimir I.; and Bushtian, Leonid V., 4,420,712., Cl. 318-41.000.

Butler, David V.: *See*—
Orlowski, Jan A.; Wagner, Helmar; and Butler, David V., 4,420,306., Cl. 433-228.000.

Butzen, William J., to Metal Era, Inc. Gravel curb. 4,419,850., Cl. 52-60.000.

Buxton, Inc.: *See*—
Kohli, Jerry L., 4,419,792., Cl. 24-170.000.

C-I-L Inc.: *See*—
Bampfield, Howard A., 4,420,349., Cl. 149-2.000.
Marz, Horst F., 4,420,440., Cl. 264-3.00B.

Cabot Corporation: *See*—
Bergman, Roger M.; Bielecki, Edwin J.; and Nippert, Charles R., Jr., 4,420,469., Cl. 423-592.000.

Cachat, Francis J.: *See*—
Rapaport, Stanley; and Cachat, Francis J., 4,420,575., Cl. 523-504.000.

Cadwell, Donald E., to Minnesota Mining and Manufacturing Company. Lithographic substrate and its process of manufacture. 4,420,549., Cl. 430-158.000.

Calandra, Frank, Jr., to Jennmar Corporation. Method for combining resin bonding and mechanical anchoring of a bolt in a rock formation. 4,419,805., Cl. 29-458.000.

Calhoun, Leslie O.: *See*—
Thorpe, Frank P.; and Calhoun, Leslie O., 4,420,090., Cl. 220-3.700.
Thorpe, Frank P.; and Calhoun, Leslie O., 4,420,091., Cl. 220-3.700.

California Institute of Technology: *See*—
Lawson, Daniel D.; and Ingham, John D., 4,420,544., Cl. 429-13.000.

California Interface and Software Limited Partnership: *See*—
Phelps, Barry C.; and Hall, John S., 4,420,174., Cl. 283-75.000.

Calor Agriculture Research, Inc.: *See*—
Juengst, Fred W., Jr.; and Dika, John A., 4,420,636., Cl. 562-589.000.

Camino Laboratories, Inc.: *See*—
Bailey, Wilber H., 4,420,000., Cl. 128-706.000.

Camp, Albert T.; and Csanady, Elmer R., to United States of America, Navy. Doublebase ballistic modifiers. 4,420,350., Cl. 149-98.000.

Campau, Daniel N., to Pepsico, Inc. Iron-type golf clubs. 4,420,156., Cl. 273-77.00A.

Canadian General Electric Company Limited: *See*—
Pierce, Gordon F., 4,420,809., Cl. 364-484.000.

Canard, Pierre; Latourrette, Bertrand; and Schorsch, Gilbert, to Rhone-Poulenc Industries. Polymeric matrices reinforced with highly dispersed synthetic zeolitic particulates. 4,420,582., Cl. 524-450.000.

Canavesi, Roberto; Aglietti, Giancarlo; and Ghezzi, Roberto, to Euteco Impianti S.p.A. Process for the preparation of catalysts based on iron and molybdenum oxides. 4,420,421., Cl. 502-316.000.

Canobbio, Paul P.: *See*—
Dray, Jacques; and Canobbio, Paul P., 4,420,745., Cl. 340-510.000.

Canon Kabushiki Kaisha: *See*—
Kanbe, Junichiro; and Fukuda, Tadaji, 4,420,546., Cl. 430-57.000.
Katsuma, Makoto; Mizogui, Toyokazu; Inobe, Takashi; Hiramatsu, Akira; Murakami, Hiroyasu; and Ishida, Toyoki, 4,420,240., Cl. 354-288.000.
Kitagishi, Nozomu, 4,420,226., Cl. 350-427.000.
Kitamura, Takashi, 4,420,761., Cl. 346-108.000.
Ogawa, Yukio; Harigaya, Isao; Yamada, Taieo; and Hirohata, Michio, 4,420,237., Cl. 354-458.000.
Sakai, Kiyoshi; Mabuchi, Minoru; Suzuki, Toshiko; Egarashi, Yuji; and Ishikawa, Shozo, 4,420,548., Cl. 430-59.000.
Suzuki, Koji; Nakahira, Joji; Kuroda, Koki; Nagashima, Nao; and Takayanagi, Yoshiaki, 4,420,247., Cl. 355-14.00C.

Cappel, Bert, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Separator for ink fountain. 4,419,932., Cl. 101-363.000.

Card, Joseph L.: *See*—
Passons, William E.; Card, Joseph L.; and Card, Roy T., 4,419,944., Cl. 112-79.00R.

Card, Roy T.: *See*—
Passons, William E.; Card, Joseph L.; and Card, Roy T., 4,419,944., Cl. 112-79.00R.

Caris, Richard F., to Interface, Inc. Weighing apparatus with overload protection for off-center loading. 4,420,054., Cl. 177-154.000.

Carl Freudenberg, Firma: *See*—
Schilling, Hermann; and Stief, Reinhard, 4,420,526., Cl. 428-171.000.

Carl-Zeiss-Stiftung: *See*—
Grosskopf, Rudolf, 4,420,768., Cl. 358-107.000.
Muchel, Franz, 4,420,219., Cl. 350-96.180.

Carlson, John E. Holographic system for the storage of audio, video and computer data. 4,420,829., Cl. 369-103.000.

Carlsson, Sven A. L.: *See*—
Opperud, Hans-Jorgen; Carlsson, Sven A. L.; and Ericson, Hans G., 4,419,909., Cl. 74-856.000.

Carminati, Giovanni M.: *See*—
Milani, Carlo; Carminati, Giovanni M.; and Sovera, Attilio, 4,420,482., Cl. 424-250.000.

Carpenter, Michael. Flotation mattress and method. 4,420,356., Cl. 156-251.000.

Carr, George S. Thermal garment design. 4,420,521., Cl. 428-74.000.

Carr, Ronald. Magnetic separator for particulates. 4,420,390., Cl. 209-216.000.

Carter, James L.; and Barnett, Allan E., to Exxon Research and Engineering Co. Process for hydrogenating organic compounds with a supported cobalt-silica coprecipitated hydrogenation catalyst. 4,420,648., Cl. 585-269.000.

Casio Computer Co., Ltd.: *See*—
Kashio, Toshio, 4,419,919., Cl. 84-1.270.
Sato, Kunio, 4,419,917., Cl. 84-1.010.

Cass, David T.: *See*—
Robbins, Richard J.; and Cass, David T., 4,420,188., Cl. 299-31.000.

Cassella Aktiengesellschaft: *See*—
Buhler, Ulrich; Kindler, Horst; Kuhlein, Klaus; Kallay, Maria; Kosubek, Uwe; Lowenfeld, Rudolf; and Roth, Kurt, 4,420,308., Cl. 8-464.000.

Castino, Franco, to American National Red Cross. Filteration method for cell produced antiviral substances. 4,420,398., Cl. 210-641.000.

Caterpillar Tractor Co.: *See*—
Goloff, Alexander, 4,420,141., Cl. 251-337.000.

Cawelti, Donald G.: *See*—
Fox, David S.; and Cawelti, Donald G., 4,420,123., Cl. 242-147.00R.

Cearley, James E.: *See*—
Dunlap, Thomas G.; Jameson, William G., Jr.; Mefford, Carl R.; Nelson, Harold L.; and Cearley, James E., 4,420,458., Cl. 376-447.000.

Cedious, Incorporated: *See*—
DiBlasio, Alfonzo W., 4,420,013., Cl. 137-382.000.

Celanese Corporation: *See*—
Gerberich, H. Robert; and Smith, Eldred T., 4,420,641., Cl. 568-473.000.

Centola, Paolo: *See*—
Codignola, Franco; Gronchi, Paolo; del Rosso, Renato; and Centola, Paolo, 4,420,634., Cl. 562-512.200.

Centra-Burkle GmbH & Co.: *See*—
Becker, Henning; and Jauss, Fritz, 4,420,693., Cl. 307-66.000.

Central Glass Company, Limited: *See*—
Ueda, Kazuo; Horio, Yoshio; Kanno, Toshiyuki; and Abe, Yoshio, 4,420,501., Cl. 427-54.100.

Centre National d'Etudes Spatiales: *See*—
Regipa, Robert, 4,420,130., Cl. 244-31.000.

Centre National pour l'Exploitation des Oceans: *See*—
Galinou, Raymond, 4,419,954., Cl. 118-207.000.

Champion International Corporation: *See*—
Meeker, David M., 4,419,837., Cl. 40-359.000.
Roccaforte, Harry I., 4,420,077., Cl. 206-45.140.

Chandran, Prem G. N.; and Matalevich, Edward S., to General Electric Company. Turn-off control means for an ac-to-dc electric power converter. 4,420,713., Cl. 318-71.000.

Chang, Ching-Te; Lee, Lian-Tze; and Su, Hsueh-Ling, to Industrial Technology Research Institute. Method for preparing organo germanium propionic acid derivatives. 4,420,430., Cl. 260-429.00R.

Chang, Hou-min: *See*—
Eaton, David C.; Kirk, Thomas K.; and Chang, Hou-min, 4,420,369., Cl. 162-29.000.

Chapin, James P. Vent cap. 4,420,094., Cl. 220-37.000.

Chapman, Lloyd. Postage scale. 4,420,056., Cl. 177-245.000.

Chemische Werke Huls A.G.: *See*—
Muller, Wolfgang H. E.; and Hofmann, Peter, 4,420,429., Cl. 260-410.90R.

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Sato, Akihiro; Kikuta, Kazutsune; Matsuda, Kenji; Uwai, Toshihiro; and Hanari, Tohru, 4,420,593., Cl. 526-128.000.
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Falk, Robert A., 4,420,434., Cl. 260-501.120.
Maier, Ludwig; and Durr, Dieter, 4,420,436., Cl. 260-944.000.
Marxer, Adrian, 4,420,619., Cl. 548-352.000.
Rempfler, Hermann, 4,420,328., Cl. 71-94.000.
Sallmann, Alfred; and Baschang, Gerhard, 4,420,490., Cl. 424-309.000.

CII Honeywell Bull: *See*—
Lecourtier, Georges; and Bouquigny, Jean-Claude, 4,420,715., Cl. 318-301.000.

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Croswell, Fred J.; and Shinkle, Charles P., 4,420,670., Cl. 219-10.810.

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Martinelli, Mario, 4,420,260., Cl. 356-351.000.

Cislak, Raymond S. Device for collecting heavy oil and transferring it to suitable container. 4,420,023., Cl. 141-198.000.

Citizen Watch Co., Ltd.: *See*—
Murata, Toshio, 4,420,264., Cl. 368-223.000.

Cito Products, Inc.: *See*—
Wieder, Horst K.; Wieder, Klaus A.; and Haberkorn, Joseph, 4,420,446., Cl. 264-40.600.

Clark, Lloyd D. Automatic contouring napkin ring. 4,420,102., Cl. 223-34.000.

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Voges, Wolfgang, 4,419,957., Cl. 118-245.000.

Clayton, Charles R. Golf club bag. 4,420,024., Cl. 206-315.400.

Clear, Theodore E.; and Dinkel, Paul E. Apparatus for manufacturing cementitious reinforced panels. 4,420,295., Cl. 425-92.000.

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Lewis, David L., 4,420,229., Cl. 351-224.000.

Cline, Robert C. Portfolio construction. 4,420,112., Cl. 229-72.000.

Cline, Warren K., to Olin Corp. Wrapper for smoking articles and method. 4,420,002., Cl. 131-334.000.

Clyde, Robert A. Catalytic heat exchanger. 4,420,462., Cl. 422-201.000.

Coate, David W.; and Selmeczi, Joseph G., to Dravo Corporation. Process for dewatering fine granular materials. 4,420,404., Cl. 210-808.000.

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Cobb, Raymond L., to Phillips Petroleum Company. Salts of 3-cyano-3-alkene-sulfinic acids and salts of 3-carbamoyl-3-alkene sulfonic acids and preparations thereof. 4,420,431., Cl. 260-465.900.

Coca-Cola Company, The: *See*—
Barrash, Marshall J., 4,420,137., Cl. 248-240.400.

Codignola, Franco; Gronchi, Paolo; del Rosso, Renato; and Centola, Paolo. Process for the oxidation of unsaturated aliphatic hydrocarbons. 4,420,634., Cl. 562-512.200.

Cohn, Kenneth H.: *See*—
May, James W., Jr.; Lukash, Frederick N.; and Cohn, Kenneth H., 4,419,999., Cl. 128-691.000.

Coke, Harry E.; and Gill, Gary W., to Southwest Techni-Systems, Inc. Synthetic running surface. 4,420,513., Cl. 427-407.100.

Cole National Corporation: *See*—
Sorrells, Frank D., 4,419,849., Cl. 51-284.00R.

Cole, Raymond; Kennedy, Raymond; and McCluskey, Lincoln, to International Playtex, Inc. Method of fabricating two layer cups and brassiere. 4,419,997., Cl. 128-489.000.

Collonia, Harald, to VDO Adolf Schindling AG. Device for the control of the traveling speed of a motor vehicle. 4,419,973., Cl. 123-396.000.

Coloroll Limited: *See*—
Griffin, Gerald J. L., 4,420,576., Cl. 524-47.000.

Combustion Engineering, Inc.: *See*—
Santalia, Richard W., 4,419,941., Cl. 110-232.000.

Commissariat a l'Energie Atomique: *See*—
Galinou, Raymond, 4,419,954., Cl. 118-207.000.

Completion Tool Company: *See*—
Wood, Edward T., 4,420,159., Cl. 277-34.000.

Conley, Kenneth E. Apparatus and method for producing a flexible sheet material having a predetermined surface characteristic. 4,420,502., Cl. 427-54.100.

Conley, Kenneth E., to Rexham Corporation. Thermoset relief patterned sheet. 4,420,527., Cl. 428-172.000.

Conrad, Richard A. Moisture proof switch assembly. 4,420,665., Cl. 200-302.000.

Containaire, Inc.: *See*—
Mueller, John J., 4,420,100., Cl. 222-205.000.

Control Fluidics, Inc.: *See*—
Tufts, Wesley M., 4,420,403., Cl. 210-787.000.

Cooper Industries, Inc.: *See*—
Peterson, Leslie D., 4,419,886., Cl. 73-151.500.

Cooper, Kersi F.; and Drake, Jerry W., to Raytheon Company. Programmable read only memory. 4,420,504., Cl. 427-90.000.

Cordis Corporation: *See*—
Tarjan, Peter P., 4,419,996., Cl. 128-419.0PG.

Core Laboratories, Inc.: *See*—
Bush, Darrell C.; and Jenkins, Ralph E., 4,419,879., Cl. 73-432.0PS.

Corning Glass Works: *See*—
Frost, Rodney I.; and Pitcher, Wayne H., Jr., 4,420,316., Cl. 55-523.000.
Tick, Paul A., 4,420,569., Cl. 501-30.000.

Cornwall, Kenneth R. Elastomeric joint for use between rigid fittings and rigid pipe and method of use. 4,420,176., Cl. 285-158.000.

Cosar, Paul; and Teraube, Raoul, to Fives-Cail Babcock. Boiler installation. 4,419,940., Cl. 110-229.000.

Coulter Electronics, Inc.: *See*—
Newton, William A.; and Graham, Marshall D., 4,420,720., Cl. 324-71.400.

Craft Line Inc.: *See*—
Vis, Arthur D.; and Sarafian, Karl, 4,420,199., Cl. 339-8.00R.

Cragoe, Edward J.: *See*—
Bolhofer, William A.; Cragoe, Edward J.; and Hoffman, Jacob M., Jr, 4,420,615., Cl. 544-279.000.

Creations 2000, Inc.: *See*—
Dupont, Andre'; Laurent, Paul; and Beaujardin, Bernard, 4,420,180., Cl. 296-1.00F.

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Oakes, Billy D.; Dupart, Michael S.; and Cringle, David C., 4,420,337., Cl. 106-14.150.

Crocker, Zenas; and Wright, A. Nelson, to Synergistics Chemicals Limited. Process for producing articles from polytetrafluoroethylene. 4,420,449., Cl. 264-68.000.

Cronin, Michael J.; and Seid, Gordon, to Lockheed Corporation. ESC energy recovery system for fuel-efficient aircraft. 4,419,926., Cl. 98-1.500.

Crossley, Frank A., to Lockheed Missiles & Space Company, Inc. Grain refinement of titanium alloys. 4,420,460., Cl. 420-417.000.

Croswell, Fred J.; and Shinkle, Charles P., to Cincinnati Milacron Industries, Inc. Control for dielectric heating in blow molding machine. 4,420,670., Cl. 219-10.810.

Crouse, Jere W.: *See*—
Dahl, Carl B.; and Crouse, Jere W., 4,420,371., Cl. 162-272.000.

Crown Zellerbach Corporation: *See*—
Hostetler, Ronald E., 4,420,372., Cl. 162-280.000.

Csanady, Elmer R.: *See*—
Camp, Albert T.; and Csanady, Elmer R., 4,420,350., Cl. 149-98.000.

Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Roba, Giacomo, 4,419,958., Cl. 118-405.000.

CTS Corporation: *See*—
Thorpe, Frank P.; and Calhoun, Leslie O., 4,420,090., Cl. 220-3.700.
Thorpe, Frank P.; and Calhoun, Leslie O., 4,420,091., Cl. 220-3.700.

Cuel, Renaud; Le Giedic, Henri; and Le Meur, Yvon, to Thomson-CSF. Electromechanical printing device for a printer of the series-parallel type. 4,420,763., Cl. 346-139.00R.

Cullen, William P.: *See*—
Sung, Rodney L.; Zoleski, Benjamin H.; Cullen, William P.; and Kablaoui, Mahmoud S., 4,420,407., Cl. 252-33.400.

Culley, Paul L.: *See*—
Wallace, Steven J.; and Culley, Paul L., 4,420,717., Cl. 318-696.000.

Cummins Engine Company, Inc.: *See*—
Shaw, Terrence M., 4,419,970., Cl. 123-41.740.
Warlick, Timothy A., 4,420,116., Cl. 239-95.000.

Custode, Frank Z.: *See*—
Tam, Matthias L.; and Custode, Frank Z., 4,419,808., Cl. 29-571.000.

Dahl, Carl B.; and Crouse, Jere W., to Beloit Corporation. Energy absorbers for vibrating headboxes. 4,420,371., Cl. 162-272.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Tachibana, Eiichi; and Katsuta, Tetsuro, 4,420,363., Cl. 156-627.000.

Daiichi Electric Co., Ltd.: *See*—
Sato, Hiroshi, 4,420,774., Cl. 360-28.000.

Dainippon Ink and Chemicals, Inc.: *See*—
Kuroda, Yoshimi; Ito, Shichinosuke; Midorikawa, Akio; and Terashima, Kuniomi, 4,420,601., Cl. 528-76.000.

Damon, Robert E., II, to Sandoz, Inc. Silicon-bearing amides. 4,420,475., Cl. 424-184.000.

Danilevich, Yanush; B.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701., Cl. 310-54.000.

Darden, Jerome W.; Watts, Lewis W., Jr.; and Marquis, Edward T., to Texaco Inc. Feedstocks for the production of synthetic lubricants. 4,420,646., Cl. 585-10.000.

Dart Container Corporation: *See*—
Dart, Kenneth B., 4,420,081., Cl. 206-519.000.

Dart, Kenneth B., to Dart Container Corporation. Step-wall nestable cup. 4,420,081., Cl. 206-519.000.

Data Card Corporation: *See*—
Price, Robert J.; and Taber, Bruce E., 4,420,819., Cl. 364-900.000.

D'Atre, John D.; and Walker, Loren H., to General Electric Company. Cross-tied current regulator for load commutated inverter drives. 4,420,719., Cl. 318-803.000.

Davies, Roderick D.; and Scott, David B., to Texas Instruments Incorporated. CMOS Source/drain implant process without compensation of polysilicon doping. 4,420,344., Cl. 148-1.500.

Davis, Larry; and Pierrat, Frank A., to Hoechst-Roussel Pharmaceuticals Inc. 1'-[3-(1,2-Benzisoxazol-3-yl) propyl]spiro[benzofuran-2(3H),3' or 4'-piperidines or 3'-pyrrolidines]. 4,420,485., Cl. 424-267.000.

Davis, Murray W.; Diedzic, Matthew J.; Knapp, Robert F.; and Whitney, Bruce F., to Davis, Murray W. Real-time parameter sensor-transmitter. 4,420,752., Cl. 340-870.170.

Dawson, Robert H.: *See*—
Leung, Chung W.; Dawson, Robert H.; Blumenfeld, Martin A.; and Biondi, Dennis P., 4,420,503., Cl. 427-85.000.

De Mets N.V.: *See*—
De Mets, Albert, 4,420,299., Cl. 425-101.000.

Dean, Noel S.; Lawton, Kenneth L.; and Yates, Vincent A., to BICC Public Limited Company. Optical guides. 4,420,220., Cl. 350-96.230.

Deckert, Kenneth L., to International Business Machines. Self-loading magnetic head air bearing slider. 4,420,780., Cl. 360-103.000.

DeClark, Bruce W.; and Weber, Joseph H., to Progressive Blasting Systems, Inc. Article manipulator mechanism for accelerated shot treating apparatus. 4,419,875., Cl. 72-53.000.

Deere & Company: *See*—
Baxter, Kenneth D.; Bluem, Gary R.; Humphrey, Dallas R.; Kittle, Carl E.; and Kluge, Douglas J., 4,419,907., Cl. 74-531.000.
Lau, Donald W., 4,420,136., Cl. 248-674.000.
Peterson, Willard E., 4,420,048., Cl. 172-568.000.

Dehoff, Robert E., to AMP, Incorporated. Fail-safe mechanism. 4,420,281., Cl. 411-392.000.

De Jager, Donald: *See*—
Jessop, Thomas C.; and De Jager, Donald, 4,420,566., Cl. 436-46.000.

de Jager, Frank, to U.S. Philips Corporation. Phase locked loop amplifier for variable amplitude radio waves. 4,420,723., Cl. 330-10.000.

Dekker, Lambert: *See*—
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,420,423., Cl. 252-522.00R.

del Rosso, Renato: *See*—
Codignola, Franco; Gronchi, Paolo; del Rosso, Renato; and Centola, Paolo, 4,420,634., Cl. 562-512.200.

Delta Associates, Inc.: *See*—
Howe, Robert L., 4,420,679., Cl. 219-400.000.

De Mets, Albert, to De Mets N.V. Continuous operation press. 4,420,299., Cl. 425-101.000.

De Mey, Jan R.; and Moeremans, Marc K. J. J., to Janssen Pharmaceutica N.V. Bright field light microscopic method of enumerating and characterizing subtypes of white blood cells and their precursors. 4,420,558., Cl. 435-7.000.

d'Entremont, Alan F.: *See—*
Seyffert, Michael; and d'Entremont, Alan F., 4,420,107., Cl. 226-32.000.

De Ron, Adriaan J.: *See—*
Van Koppen, Christianus W. J.; Rademaker, Onno; and De Ron, Adriaan J., 4,420,032., Cl. 165-1.000.

DeWilde, Mark A.; and Beyer, Richard A., to United States of America, Army. Adiabatic burner for premixed gases. 4,420,255., Cl. 356-315.000.

Dewing, Kenneth M., to Terra Bella Industries. Device for handling refuse or the like material. 4,420,168., Cl. 280-43.100.

D'hont, Dirk M.: *See—*
Van Besauw, Jan F.; Leenders, Luc H.; D'hont, Dirk M.; Kokelenberg, Hendrik E.; and Samijn, Rafael P., 4,420,553., Cl. 430-275.000.

Diamond Automations, Inc.: *See—*
Siciliano, Anthony J., 4,419,962., Cl. 119-17.000.

Diamond, Edmond D.; Maciolek, Joseph R.; and Kingston, Leo, to United Technologies Corporation. Multi-axis force stick, self-trimmed aircraft flight control system. 4,420,808., Cl. 364-434.000.

Diamond International Corp.: *See—*
O'Neill, Richard K., 4,420,101., Cl. 222-212.000.

DiBlasio, Alfonzo W., to Cedious, Incorporated. Regulator guard. 4,420,013., Cl. 137-382.000.

Dickhudt, Eugene A.; and Paulson, Roger A., to Medtronic, Inc. Method of making biomedical lead with lobed lead anchor. 4,419,819., Cl. 29-857.000.

Diedzic, Matthew J.: *See—*
Davis, Murray W.; Diedzic, Matthew J.; Knapp, Robert F.; and Whitney, Bruce F., 4,420,752., Cl. 340-870.170.

Diery, Helmut; and Hille, Martin, to Hoechst Aktiengesellschaft. Oxyalkylated addition products from ethylene oxide-propylene oxide block polymers and bis-glycidyl ethers and their use. 4,420,413., Cl. 252-331.000.

Dieter Graesslin Feinwerktechnik: *See—*
Kammerer, Gerd, 4,420,666., Cl. 200-340.000.

Dietrich, Hans, to Losinger AG. Device for preserving connecting bars for concrete structural members. 4,419,852., Cl. 52-309.160.

Dietrich, Michel J., to Jeumont-Schneider. Device for the transmission of information through the rails between a railway track and a group of vehicles running along this track. 4,420,133., Cl. 246-167.00R.

Diffracto Ltd.: *See—*
Pryor, Timothy R., 4,420,253., Cl. 356-237.000.

Dilenno, Steven J. Universal carrying case. 4,420,104., Cl. 224-250.000.

Dika, John A.: *See—*
Juengst, Fred W., Jr.; and Dika, John A., 4,420,636., Cl. 562-589.000.

Dillon, Joseph C. Flexible, non-kinkable hose and method for making the same. 4,420,019., Cl. 138-129.000.

Dinkel, Paul E.: *See—*
Clear, Theodore E.; and Dinkel, Paul E., 4,420,295., Cl. 425-92.000.

Director-General of Agency of Industrial Science & Technology: *See—*
Yuki, Nakaji; and Kitagawa, Hiroshi, 4,420,415., Cl. 568-180.000.

Director Genereal of Agency of Industrial Science & Technology: *See—*
Aiba, Seiichi; Hiratani, Kazuhisa; and Nakagawa, Tsutomu, 4,420,612., Cl. 536-102.000.

Dischert, William A., to RCA Corporation. Method and apparatus for rotating a stylus during lapping. 4,419,848., Cl. 51-229.000.

Diversey Corporation: *See—*
Hagens, Rodger G.; and Hui, Dominic K., 4,420,578., Cl. 524-322.000.

Dobler, Peter: *See—*
Gliniorz, Lothar; Dobler, Peter; Schoettle, Klaus; Flohr, Joachim; and Maerthesheimer, Rolf, 4,420,079., Cl. 206-387.000.

Dr. Johannes Heidenhain GmbH: *See—*
Oberhans, Johann, 4,419,824., Cl. 33-143.00L.
Schmitt, Walter, 4,420,699., Cl. 307-519.000.

Dolejsi, Edward; and Archer, Robert G. Combination text and picture display system. 4,420,234., Cl. 353-122.000.

Dominguez, Richard J. G., to Texaco Inc. Reaction injection molded elastomer containing an internal mold release made by a two-stream system. 4,420,570., Cl. 521-112.000.

Dommer, Hans-Martin; Bareis, Alfred; and Bergmann, Ewald, to L. Schuler GmbH. Press drive. 4,419,929., Cl. 100-257.000.

Donovan, William F.: *See—*
Coates, Arthur D.; Donovan, William F.; Rakaczky, John A.; and Scott, Wayman E., 4,419,936., Cl. 102-364.000.

Dorey, Howard A.; and Ley, Anthony J., to Sangamo Weston Limited. Electricity meters. 4,420,721., Cl. 324-110.000.

Dorma Door Controls Inc.: *See—*
Lieberman, Sidney, 4,419,787., Cl. 16-65.000.

Douglass, Donald C., to Wilderness Group Inc. Backpack. 4,420,103., Cl. 224-210.000.

Dow Chemical Company, The: *See—*
Hefner, Robert E., Jr., 4,420,587., Cl. 525-39.000.
Herman, Jim T.; Bryce, Kenneth L.; and Lancaster, Gerald M., 4,420,580., Cl. 524-424.000.
Larsen, Eric R.; and Ecker, Ernest L., 4,420,416., Cl. 502-168.000.
Oakes, Billy D.; Dupart, Michael S.; and Cringle, David C., 4,420,337., Cl. 106-14.150.

Dowty (South Africa) (Proprietary) Limited: *See—*
Walker, Andrew J.; and Watt, John C., 4,420,278., Cl. 405-301.000.

Drach, John E., to Scott Paper Company. Latex binders for fibrous webs. 4,420,368., Cl. 162-8.000.

Drackett Company, The: *See—*
Richards, Randall G., 4,419,771., Cl. 4-228.000.

Drag Specialties, Inc.: *See—*
Stahel, Alwin J.; and Preisler, James M., 4,420,803., Cl. 362-369.000.

Drake, Jerry W.: *See—*
Cooper, Kerni F.; and Drake, Jerry W., 4,420,504., Cl. 427-90.000.

Dravo Corporation: *See—*
Coste, David W.; and Selmeczi, Joseph G., 4,420,404., Cl. 210-808.000.

Dray, Jacques; and Canobbio, Paul P., to Societe Anonyme Trefilunion. Security system. 4,420,745., Cl. 340-510.000.

Dreier, Ernst: *See—*
Ruch, Urs; and Dreier, Ernst, 4,419,951., Cl. 112-323.000.

Dreiling, Sebastian E. Guide means for sliding drawers. 4,420,197., Cl. 312-330.00R.

Dresser Industries, Inc.: *See—*
Sharki, Martin J., 4,420,391., Cl. 209-403.000.

Drutchas, Gilbert H., to TRW Inc. Power steering pump. 4,420,290., Cl. 417-283.000.

Dubrovsky, Evgeny V. Corrugated-surface heat exchange element. 4,420,039., Cl. 165-152.000.

Ducati, Umberto, to Rambaldini, Gianfranco. Method for extracting heavy metals from sulphurated mineral concentrates. 4,420,380., Cl. 204-66.000.

Dudash, Allan A., to Westinghouse Electric Corp. Optically coupled bidirectional transceiver. 4,420,841., Cl. 455-607.000.

Dufresne, Louis L.: *See—*
Bolton, Joseph A.; and Dufresne, Louis L., 4,420,402., Cl. 210-783.000.

Dulen, Edwina K.: *See—*
Larson, Willis A.; and Dulen, Edwina K., 4,420,663., Cl. 200-159.00B.

Dunick, Peter: *See—*
Dyck, Ralph; and Dunick, Peter, 4,419,918., Cl. 84-1.030.

Dunlap, Thomas G.; Jameson, William G., Jr.; Mefford, Carl R.; Nelson, Harold L.; and Cearley, James E., to General Electric Company. Nuclear fuel assembly with coolant conducting tube. 4,420,458., Cl. 376-447.000.

Dunn, Charles S.; and Seng, Stephen, to Owens-Corning Fiberglas Corporation. Electrode replacement apparatus. 4,420,838., Cl. 373-92.000.

Dupart, Michael S.: *See—*
Oakes, Billy D.; Dupart, Michael S.; and Cringle, David C., 4,420,337., Cl. 106-14.150.

Dupont, Andre'; Laurent, Paul; and Beaujardin, Bernard, to Creations 2000, Inc. Automobile floor mat with moisture collecting feature. 4,420,180., Cl. 296-1.00F.

Du Pont de Nemours, E. I., and Company: *See—*
Ferretti, August, 4,420,422., Cl. 252-518.000.
Gorondy, Emery J., 4,420,307., Cl. 8-444.000.
Sauers, Richard F., 4,420,325., Cl. 71-92.000.
Uschold, Ronald E., 4,420,638., Cl. 568-415.000.

Durr, Dieter: *See—*
Maier, Ludwig; and Durr, Dieter, 4,420,436., Cl. 260-944.000.

Duverne, Jean-Benoit, to Framatome. Device for supporting and moving a tool within a tapping. 4,419,847., Cl. 51-90.000.

Dvorak, Herman G.; Klapatch, Robert D.; Russell, Sid; and Spadaccini, Louis J., to United Technologies Corporation. Fuel-air mixing apparatus. 4,419,863., Cl. 60-748.000.

Dworak, Ulf; Jud, Hans; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, to Feldmuhle Aktiengesellschaft. Machine component of oxide ceramic material. 4,420,142., Cl. 251-368.000.

Dyck, Ralph; and Dunick, Peter, to Roland Corporation. Synchronizing signal generator and an electronic musical instrument using the same. 4,419,918., Cl. 84-1.030.

Dynamit Nobel AG: *See—*
Schmidt, Hans-Georg, 4,420,629., Cl. 560-70.000.

Dynatec International, Inc.: *See—*
Loftus, Nolan M., 4,419,978., Cl. 124-62.000.

E.G.O. Elektro-Gerate Blanc u. Fischer: *See—*
Treffinger, Karl; and Reimold, Gunther, 4,420,072., Cl. 192-139.000.

E. Kindt AG: *See—*
Kindt, Emanuel; and Sautter, Joachim, 4,420,358., Cl. 156-356.000.

E. R. Squibb & Sons, Inc.: *See—*
Haslanger, Martin F.; and Sprague, Peter W., 4,420,626., Cl. 549-386.000.
Sykes, Richard B., 4,420,474., Cl. 424-121.000.
Varma, Ravi K., 4,420,428., Cl. 260-397.450.

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Yanai, Tadamasa; Sagehashi, Risaburo; Kameyama, Yoshio; and Shimomura, Takao, 4,420,162., Cl. 277-96.100.

Easley, Othel D., Jr., to Reactor Services International, Inc. Pressure impulse dense phase conveying apparatus and method. 4,420,279., Cl. 406-14.000.

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Booms, Robert E.; and Holstead, Colin, 4,420,556., Cl. 430-549.000.
Evans, Steven; and Elwood, James K., 4,420,550., Cl. 430-223.000.
Jessop, Thomas C.; and De Jager, Donald, 4,420,566., Cl. 436-46.000.

Krueger, Spencer M.; and Brown, James W., III, 4,420,555., Cl. 430-507.000.
McFarlane, Finley E.; and Taylor, Robert B., 4,420,581., Cl. 524-431.000.
Meckel, Benjamin B., 4,420,505., Cl. 427-131.000.
Morris, John C.; and Jackson, Winston J., Jr., 4,420,607., Cl. 528-298.000.
Yacobucci, Paul D.; and Wilson, John C., 4,420,630., Cl. 560-104.000.

Eaton Corporation: *See*—
Chen, C. Gregory; Lee, Ping S.; Theisen, Peter J.; and Krstic, Slobodan, 4,420,784., Cl. 361-7.000.
Franz, Rudolph J., 4,420,033., Cl. 165-26.000.
Hillebrand, George A., 4,419,977., Cl. 123-502.000.

Eaton, David C.; Kirk, Thomas K.; and Chang, Hou-min, to United States of America, Agriculture. Process for the decolorization of pulp mill bleach plant effluent. 4,420,369., Cl. 162-29.000.

Eberle, William J., to General Battery Corporation. Electrodes for use in the extrusion-fusion welding of lead parts through an aperture in a battery case and method of extruding, fusing and forging lead connections in battery cases. 4,420,673., Cl. 219-78.160.

Eberlein, Dietmar: *See*—
Schultes, Max; and Eberlein, Dietmar, 4,420,149., Cl. 271-10.000.

Ebert, Thomas P. Whirlpool bath. 4,419,775., Cl. 4-542.000.

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Eckels, Robert E. Magnetic edge seal for solar collector film. 4,419,982., Cl. 126-426.000.

Ecker, Ernest L.: *See*—
Larsen, Eric R.; and Ecker, Ernest L., 4,420,416., Cl. 502-168.000.

Eckhardt, Roger S.: *See*—
Law, Don C.; Mortenson, Carl N.; Ripple, Paul; and Eckhardt, Roger S., 4,420,166., Cl. 280-5.240.

Edison Price, Incorporated: *See*—
Smester, Paul R.; and Price, Edison A., 4,420,802., Cl. 362-364.000.

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Egarashi, Yuji: *See*—
Sakai, Kiyoshi; Mabuchi, Minoru; Suzuki, Toshiko; Egarashi, Yuji; and Ishikawa, Shozo, 4,420,548., Cl. 430-59.000.

Egosi, Dan. Energy conversion method and system. 4,420,373., Cl. 202-173.000.

Eichhorn, Friedrich: *See*—
Hirsch, Peter; Wubbels, Bernhard; and Thomson, Iwar, 4,420,676., Cl. 219-160.000.

Eicken, Karl; Plath, Peter; and Wuerzer, Bruno, to BASF Aktiengesellschaft. 5-Amino-1-di-or tri-substituted phenylpyrazole-4-carboxylic acid methyl esters. 4,420,324., Cl. 71-92.000.

Eisinger, Hans; and Kraus, Quido, to Eisinger, Hans. Device for the feeding of material bars for processing machines. 4,420,284., Cl. 414-17.000.

Eketorp, Sven: *See*—
Frykendahl, Bjorn, 4,420,031., Cl. 164-473.000.

Eli Lilly and Company: *See*—
Morwick, Tina M.; Paget, Charles J.; and Wikel, James H., 4,420,479., Cl. 424-246.000.

Elkem Metals Company: *See*—
Mohr, Bernard; Pappas, Nicholas J.; Chopra, Kuldip S.; and Salensky, George A., 4,420,340., Cl. 106-288.00B.

Ellis, John C., Jr. Water degasification and distillation apparatus. 4,420,374., Cl. 202-176.000.

Ellis, Robert L.: *See*—
Larson, Gerald L.; Ellis, Robert L.; and Baker, Daniel A., 4,420,668., Cl. 219-10.55B.

Elton, Craig T.; and Reynolds, Stephen, to Lever Brothers Company. Citrus flavored mouthwash formulation method. 4,420,471., Cl. 424-49.000.

Elwood, James K.: *See*—
Evans, Steven; and Elwood, James K., 4,420,550., Cl. 430-223.000.

Emhart Industries, Inc.: *See*—
Shedigian, Vandos, 4,420,791., Cl. 361-319.000.
Surko, Walter E., Jr., 4,419,786., Cl. 16-51.000.

Emms, Norman R.: *See*—
Taylor, Gerald M.; and Emms, Norman R., 4,420,178., Cl. 294-158.000.

EMS Thermplant Limited: *See*—
Jenkins, Francis J.; and Jenkins, Michael J., 4,419,966., Cl. 122-4.00D.

Endoh, Koichi: *See*—
Tsuji, Nobuhiko; Nakamura, Keijiroh; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, 4,420,564., Cl. 435-288.000.

Endress u. Hauser GmbH u. Co.: *See*—
Kompa, Gunter, 4,420,250., Cl. 356-5.000.

English Electric Valve Company Limited: *See*—
Pickering, Alan H., 4,420,710., Cl. 315-39.770.

Enkegaard, Torben, to F. L. Smidth & Co. Combustion plant. 4,419,964., Cl. 122-4.00D.

Epson Corporation: *See*—
Okada, Junichi, 4,420,764., Cl. 346-140.00R.

Epstein, Peter F.; Peveler, Richard D.; and Fisch, Michael H., to Witco Chemical Corporation. Preparation of a 2-aralkyl-5,5-dialkyl-1,3,2-dioxaphosphorinan-2-one from 2-aralkoxy-5,5-dialkyl-1,3,2-dioxaphosphorinane. 4,420,437., Cl. 260-969.000.

Ericson, Hans G.: *See*—
Opperud, Hans-Jorgen; Carlsson, Sven A. L.; and Ericson, Hans G., 4,419,909., Cl. 74-856.000.

Ermert, Wolfgang; Funk, Hans W.; and Klein, Rudi, to Wolff Walsrode Aktiengesellschaft. Composite films for deep-drawn packings. 4,420,516., Cl. 428-35.000.

Ernst Thielenhaus KG: *See*—
Voigt, Heinz; and Wolters, Martin, 4,419,845., Cl. 51-42.000.

Esselte Pendaflex Corporation: *See*—
Holland-Letz, Gunter, 4,419,930., Cl. 101-93.180.

Esser, Karl-Josef, to Scharmann GmbH & Co. Tool changing device on machine tools, particularly on horizontal boring and milling machines. 4,419,806., Cl. 29-568.000.

Essex Group, Inc.: *See*—
Saunders, Hollis S.; and Payette, Lionel J., 4,420,536., Cl. 428-383.000.

ETA S.A., Fabriques d'Ebauches: *See*—
Besson, Rene; and Bron, Alphonse, 4,420,263., Cl. 368-80.000.

Etablissement Public de Diffusion dit "Telediffusion de France" : *See*—
Noirel, Yves M., 4,420,833., Cl. 370-83.000.

Ethyl Corporation: *See*—
Thomas, Samuel G., Jr., 4,420,311., Cl. 44-53.000.

Ethyl Products Company: *See*—
Kirk, Donald C., Jr., 4,420,096., Cl. 222-44.000.

Eurometaal N.V.: *See*—
Van Koppen, Christianus W. J.; Rademaker, Onno; and De Ron, Adriaan J., 4,420,032., Cl. 165-1.000.

Euteco Impianti S.p.A.: *See*—
Canavesi, Roberto; Aglietti, Giancarlo; and Ghezzi, Roberto, 4,420,421., Cl. 502-316.000.

Evans, Steven; and Elwood, James K., to Eastman Kodak Company. Photographic products and processes employing novel nondiffusible magenta dye-releasing compounds and precursors thereof. 4,420,550., Cl. 430-223.000.

Evans, Tony L. Cant production. 4,419,914., Cl. 83-407.000.

Evens, Georges G., to Stamicarbon B.V. Process for the preparation of copolymers of ethylene with at least one other 1-alkene. 4,420,595., Cl. 526-141.000.

Everest, Charles E.; and Walker, Graham K. Infrared temperature monitoring apparatus having means for sky radiation compensation. 4,420,265., Cl. 374-133.000.

Excello Specialty Company, The: *See*—
Jones, Wallace R.; Krieger, Paul A.; and Haas, John F., 4,420,520., Cl. 428-42.000.

Exxon Research and Engineering Co.: *See*—
Carter, James L.; and Barnett, Allan E., 4,420,648., Cl. 585-269.000.

F. L. Smidth & Co.: *See*—
Enkegaard, Torben, 4,419,964., Cl. 122-4.00D.
Knudsen, Hans B., 4,420,302., Cl. 432-14.000.
Knudsen, Hans B., 4,420,303., Cl. 432-14.000.

Failmezger, Friedrich; and Lat, Geronimo E., to United States Gypsum Company. Method for treating the surface of a metal to improve the adhesion of a cementitious joint compound thereto. 4,419,853., Cl. 52-741.000.

Fairchild Camera and Instrument Corporation: *See*—
Lehrer, William I., 4,420,365., Cl. 156-643.000.
Tickle, Andrew C., 4,420,497., Cl. 427-8.000.

Fairchild, Wayne K. Automatic flexible tube cutter. 4,419,798., Cl. 29-33.00T.

Falk, Gerhard: *See*—
Zahn, Heinrich; and Falk, Gerhard, 4,420,109., Cl. 226-181.000.

Falk, Robert A., to Ciba-Geigy Corporation. Perfluoralkyl anion/perfluoroalkyl cation ion pair complexes. 4,420,434., Cl. 260-501.120.

Farr, Glyn P. R., to Lucas Industries Limited. Hydraulic master cylinders. 4,419,862., Cl. 60-562.000.

Farris, David L. Apparatus for establishing the junction contour for intersecting pipes. 4,419,828., Cl. 33-175.000.

Faurholdt, Bent. Incinerator for chemical waste material stored in barrels. 4,419,943., Cl. 110-237.000.

Fay, Gary V.; and Pshaenich, Alvin, to Motorola Inc. Semiconductor current regulator and switch. 4,420,700., Cl. 307-571.000.

Federal Products Corporation: *See*—
Miller, Mark H., 4,419,829., Cl. 33-178.00R.
Miller, Mark H., 4,419,830., Cl. 33-178.00R.

Feldmuhle Aktiengesellschaft: *See*—
Dworak, Ulf; Jud, Hans; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,420,142., Cl. 251-368.000.

Felix, Larry L. Apparatus for enabling concealing surveillance by use of a camera in a vehicle. 4,420,238., Cl. 354-81.000.

Ferag AG: *See*—
Reist, Walter, 4,420,146., Cl. 270-55.000.

Ferranti plc: *See*—
Ashforth, John V., 4,420,729., Cl. 333-159.000.

Ferretti, August, to Du Pont de Nemours, E. I., and Company. Method for making high surface area bismuth-containing pyrochlores. 4,420,422., Cl. 252-518.000.

Ferrigno, Thomas H. Stabilized surface modified fillers. 4,420,341., Cl. 106-308.00Q.

Fichtel & Sachs AG: *See*—
Axthammer, Ludwig, 4,419,804., Cl. 29-434.000.

Fiedler, Gerhard; Fritzsche, Werner; Herold, Frank; and Tolkmitt, Uwe, to VEB Kombinat Wolle und Seide. Process and apparatus for monitoring thread breakage by the use of a threshold device. 4,420,697., Cl. 307-308.000.

Filimonov, Evgeny F.: *See*—
Kostikov, Valery I.; Koshelev, Jury I.; Telegin, Vasily D.; Khomenko, Alexandr A.; and Filimonov, Evgeny F., 4,420,539., Cl. 428-450.000.
Fillenwarth, Dale R.: *See*—
Washington, James M.; Fillenwarth, Dale R.; and Utsch, Francis V., 4,420,635., Cl. 562-555.000.
Fingerle, Dieter: *See*—
Dworak, Ulf; Jud, Hans; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,420,142., Cl. 251-368.000.
Finkelstein, Sam D., to MPL Inc. Tamper-resistant pharmaceutical vial and cap assembly. 4,420,092., Cl. 220-254.000.
Fiorese, Franco F.: *See*—
McMahon, Roberta; and Fiorese, Franco F., 4,420,567., Cl. 436-169.000.
Fisch, Michael H.: *See*—
Epstein, Peter F.; Peveler, Richard D.; and Fisch, Michael H., 4,420,437., Cl. 260-969.000.
Fischer, Jochen; and Scholl, Hans, to Kochs Adler AG. Feeding device for an automatic sewing arrangement. 4,419,946., Cl. 112-121.120.
Fisher, Amnon, to National Semiconductor Corporation. Synchronous priority circuit. 4,420,695., Cl. 307-242.000.
Fitzky, Hans-Georg: *See*—
Ebneth, Harold; and Fitzky, Hans-Georg, 4,420,757., Cl. 343-912.000.
Fives-Cail Babcock: *See*—
Cosar, Paul; and Teraube, Raoul, 4,419,940., Cl. 110-229.000.
Fladda, Gerdt; and Pettersson, Thorulf, to Svenska Traforskningsinstitutet. Dust measurement. 4,420,256., Cl. 356-336.000.
Flannelly, William G., to Kaman Aerospace Corporation. Vibration isolator with crank driven inertia bar. 4,420,134., Cl. 248-559.000.
Flocord S.A.: *See*—
Batisse, Claude, 4,420,360., Cl. 156-390.000.
Flohr, Joachim: *See*—
Gliniorz, Lothar; Dobler, Peter; Schoettle, Klaus; Flohr, Joachim; and Maerthesheimer, Rolf, 4,420,079., Cl. 206-387.000.
FMC Corporation: *See*—
Franko-Filipasic, Borivoj R.; and Snyder, James, 4,420,642., Cl. 568-753.000.
Fogg, Sidney G.; Robertson, Frank C.; and Wilson, Douglas, to British Petroleum Company p.l.c., The. Method of treating water-in-oil dispersions. 4,420,573., Cl. 523-333.000.
Folta, Werner: *See*—
Kost, Erwin; and Folta, Werner, 4,420,287., Cl. 414-729.000.
Forberg, Horst; Radelow, Wolfgang; Achtnig, Klaus-Peter; and Muller, Manfred, to Krone GmbH. Surge-protected cable joint. 4,420,200., Cl. 339-13.000.
Ford Aerospace & Communications Corporation: *See*—
Meyer, Theodore O.; and Hickman, Thomas E., 4,420,545., Cl. 429-101.000.
Forster, Helmut. Apparatus for relieving the spinal column. 4,419,990., Cl. 128-75.000.
Foster Wheeler Energy Corporation: *See*—
Garcia-Mallol, Juan A.; and Alliston, Michael G., 4,419,965., Cl. 122-4.00D.
Fowler, David P., to Frito-Lay, Inc. Apparatus for applying seasoning. 4,419,953., Cl. 118-16.000.
Fox, David S.; and Cawelti, Donald G., to United States of America, Army. Force rate sensor assembly. 4,420,123., Cl. 242-147.00R.
Framatome: *See*—
Duverne, Jean-Benoit, 4,419,847., Cl. 51-90.000.
Le Pargneux, Jacques, 4,420,457., Cl. 376-446.000.
Francis, David B., to International Business Machines Corporation. Apparatus and method for removal of sinusoidal noise from a sampled signal. 4,420,815., Cl. 364-724.000.
Franko-Filipasic, Borivoj R.; and Snyder, James, to FMC Corporation. Selective removal and recovery of catechol mixed with 2-methallyloxyphenol. 4,420,642., Cl. 568-753.000.
Franz, Rudolph J., to Eaton Corporation. System for automatically controlling vehicle compartment temperature and transducer therefor. 4,420,033., Cl. 165-26.000.
Frase, Dietmar: *See*—
Ruppert, Helmut; and Frase, Dietmar, 4,419,901., Cl. 73-862.490.
Fredriksson, Hasse: *See*—
Frykendahl, Bjorn, 4,420,031., Cl. 164-473.000.
Freeman, Michael. Interactive telephone answering system. 4,420,656., Cl. 179-6.040.
Freeman, Robert D.: *See*—
Argumedo, Armando J.; Chow, William W.; Freeman, Robert D.; and Kleczkowski, Stawomir P., 4,420,782., Cl. 360-129.000.
Friedman, Oswald: *See*—
Maucher, Paul; and Friedman, Oswald, 4,420,070., Cl. 192-48.800.
Frito-Lay, Inc.: *See*—
Fowler, David P., 4,419,953., Cl. 118-16.000.
Fritz Gegauf Aktiengesellschaft Bernina-Nahmaschinenfabrik: *See*—
Ruch, Urs; and Dreier, Ernst, 4,419,951., Cl. 112-323.000.
Fritzsche, Werner: *See*—
Fiedler, Gerhard; Fritzsche, Werner; Herold, Frank; and Tolkmitt, Uwe, 4,420,697., Cl. 307-308.000.
Frolova, Irina B.: *See*—
Belkin, German S.; Voskresensky, Stal N.; Kiselev, Viktor Y.; Lukatskaya, Ida A.; Rodionov, Valery V.; Skurikhin, Mikhail N.; Frolova, Irina B.; Zuev, Vyacheslav S.; Kornevv, Lev I.; Chervonenkis, Rauza A.; Rabinovich, Efim M.; Volkova, Tatyana P.; and Goryaev, German A., 4,420,346., Cl. 148-4.000.
Frost, Rodney I.; and Pitcher, Wayne H., Jr., to Corning Glass Works. Filter apparatus and method of making it. 4,420,316., Cl. 55-523.000.
Frykendahl, Bjorn, to Eketorp, Sven; Fredriksson, Hasse; Strandell, Per Olof; and Frykendahl, Bjorn. Method of casting metal including disintegration of molten metal. 4,420,031., Cl. 164-473.000.
Frymaster Corporation, The: *See*—
Moore, L. Frank; and Price, George M., 4,420,006., Cl. 134-167.00R.
Fuji Electric Company, Ltd.: *See*—
Tsuji, Nobuhiko; Nakamura, Keijiroh; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, 4,420,564., Cl. 435-288.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Kubota, Masaharu; Kudo, Ichiro; and Ohgami, Masaaki, 4,419,975., Cl. 123-440.000.
Fuji Oil Company, Limited: *See*—
Matsuo, Takaharu; Sawamura, Norio; Hashimoto, Yukio; and Hashida, Wataru, 4,420,560., Cl. 435-134.000.
Fuji Photo Film Co., Ltd.: *See*—
Nakauchi, Kenji, 4,420,252., Cl. 356-225.000.
Ogawa, Hiroshi; and Tamai, Yasuo, 4,420,540., Cl. 428-457.000.
Okiyama, Toshiaki, 4,420,528., Cl. 428-220.000.
Yamaguchi, Nobutaka; Fujiyama, Masaaki; and Nasu, Norio, 4,420,532., Cl. 428-329.000.
Fuji Xerox Co., Ltd.: *See*—
Okamura, Akio; Tanaka, Shuji; and Sakamoto, Tamotsu, 4,419,960., Cl. 118-712.000.
Fujii, Tadaomi: *See*—
Takagi, Tomio; Ueda, Jitsuhiko; Fujii, Tadaomi; and Tanaka, Kazuhiko, 4,420,335., Cl. 75-124.000.
Fujikawa, Mitsunobu: *See*—
Takano, Yoshikazu; Kamimura, Tomohisa; and Fujikawa, Mitsunobu, 4,420,779., Cl. 360-92.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Inoue, Yoshikazu; Yasuda, Nobuyoshi; and Murata, Masayoshi, 4,420,477., Cl. 424-246.000.
Fujitsu Limited: *See*—
Shimada, Hiroshi, 4,420,823., Cl. 365-206.000.
Wakatsuki, Noboru; Kojima, Yuji; and Ono, Masaaki, 4,420,730., Cl. 333-195.000.
Watanabe, Yoshio; and Iijima, Nobuo, 4,420,223., Cl. 350-310.000.
Zasio, John J., 4,420,691., Cl. 250-491.100.
Fujiwara, Michiaki; and Uramoto, Makoto, to Murata Kikai Kabushiki Kaisha. Spinning apparatus provided with knotting truck. 4,419,861., Cl. 57-261.000.
Fujiwara, Toshihide; and Kamachi, Shinichi, to Olympus Optical Co., Ltd. Fractionating method in electrophoreses. 4,420,383., Cl. 204-180.00G.
Fujiwara, Toshihide, to Olympus Optical Co., Ltd. Method for determining boundary points on electrophoretic patterns and means therefor. 4,420,384., Cl. 204-180.00G.
Fujiyama, Masaaki: *See*—
Yamaguchi, Nobutaka; Fujiyama, Masaaki; and Nasu, Norio, 4,420,532., Cl. 428-329.000.
Fukano, Yoshimasa; and Yoshizawa, Minoru, to Toray Silicone Company, Ltd. Hydraulic system and hydraulic fluid compositions comprising siloxane-oxyalkylene copolymers. 4,420,409., Cl. 252-78.300.
Fukatsu, Kohichi: *See*—
Yamashita, Yoshisato; Inoue, Masanobu; and Fukatsu, Kohichi, 4,420,468., Cl. 423-482.000.
Fukino, Tadashi: *See*—
Yamada, Hiromichi; Suzuki, Atsushi; Oba, Yoichi; Uchida, Yoko; Kohno, Hideki; Fukino, Tadashi; and Yoshida, Minoru, 4,420,444., Cl. 264-21.000.
Fukuda, Mitsutoshi; Baba, Nobuyuki; and Arichika, Kenji, to Toyo Soda Manufacturing Co., Ltd. Laser light scattering photometer. 4,420,257., Cl. 356-341.000.
Fukuda, Sunichi; and Muto, Masaaki, to Rogers Corporation. High capacitance bus bar and method of manufacture thereof. 4,420,653., Cl. 174-72.00B.
Fukuda, Tadaji: *See*—
Kanbe, Junichiro; and Fukuda, Tadaji, 4,420,546., Cl. 430-57.000.
Fukuda, Tamotsu: *See*—
Hattori, Tadashi; Yoshida, Hitoshi; Akutagawa, Keichi; Takata, Akira; and Fukuda, Tamotsu, 4,419,972., Cl. 123-337.000.
Fukuoka, Tatsuhiko: *See*—
Takenaka, Akira; and Fukuoka, Tatsuhiko, 4,420,163., Cl. 277-96.100.
Fukushima, Masao, to Nissan Motor Co., Ltd. Automotive vehicle noise reduction device. 4,420,062., Cl. 181-204.000.
Fuller, Harrison W., to Sanders Associates, Inc. Cantilevered-beam, fiber-optic angular accelerometer. 4,419,895., Cl. 73-517.00A.
Fuller, John M. Rotary filing device. 4,420,196., Cl. 312-186.000.
Funcik, Jack F.; and Kolanowski, Clarence, to Molex Incorporated. Electrical harness fabrication apparatus. 4,419,817., Cl. 29-749.000.
Funk, Hans W.: *See*—
Ermert, Wolfgang; Funk, Hans W.; and Klein, Rudi, 4,420,516., Cl. 428-35.000.
Furukawa Electric Company, Ltd., The: *See*—
Shiga, Shoji; Suzuki, Akitoshi; Goma, Yasuo; and Kawada, Kenji, 4,420,377., Cl. 204-28.000.
Furusaki, Shinichi; Manada, Noriaki; Yamashina, Hisao; and Matsuda, Masaoki, to Ube Industries, Ltd. Process for the preparation of an ester of formic acid. 4,420,633., Cl. 560-232.000.
Furuta, Kenji, to Olympus Optical Co., Ltd. Tape recorder with cue processor. 4,420,777., Cl. 360-61.000.

Furuta, Mitsuru; and Nakashimizu, Takeo, to Kabushiki Kaisha Ishi'a Koki Seisakusho. Weighing apparatus. 4,420,051., Cl. 177-25.000.

Fusser, Hermann, to SMS Schloemann Siemag Aktiengesellschaft. Hydraulic drop forging press of above-construction with prestressed press frame. 4,419,878., Cl. 72-455.000.

Futaki, Kiyoshi: *See*—
Ohashi, Minoru; Futaki, Kiyoshi; and Iwaosa, Katsuaki, 4,420,554., Cl. 430-446.000.

Fuwa, Yoshio: *See*—
Kondo, Katsumi; Fuwa, Yoshio; Harayama, Akira; and Nakahora, Toru, 4,420,543., Cl. 428-564.000.

Gachot, Jean. Butterfly valve and a method of manufacture of said valve. 4,420,140., Cl. 25-152.000.

Galinou, Raymond, to Commissariat a l'Energie Atomique; and Centre National pour l'Exploitation des Oceans. Device for applying a coating to a surface submerged in a liquid. 4,419,954., Cl. 118-207.000.

Galoob, David. Miniature gum machine. 4,420,095., Cl. 221-265.000.

GAO Gesellschaft fur Automation und Organisation mbH: *See*—
Hoppe, Joachim; and Haghiri-Tehrani, Yahya, 4,420,683., Cl. 235-492.000.

Garcia, John C.: *See*—
Lochhead, Robert Y.; and Garcia, John C., 4,420,596., Cl. 526-212.000.

Garcia-Mallol, Juan A.; and Alliston, Michael G., to Foster Wheeler Energy Corporation. Fluidized reinjection of carryover in a fluidized bed combustor. 4,419,965., Cl. 122-4.00D.

Garrett Corporation, The: *See*—
Laham, Herman C., 4,420,160., Cl. 277-40.000.

Gartner, William J., to Halex, Inc. Bacteriocidal resins and disinfection of water therewith. 4,420,590., Cl. 525-357.000.

Gaughan, Edmund J., to Stauffer Chemical Company. Thiophosphoryl carbamate herbicide antidotes. 4,420,323., Cl. 71-87.000.

Gauthier, Andre, to Societe Anonyme de Telecommunications. Large-surface fast photodetector sensitive in the 0.8–1.1 μm range. 4,420,684., Cl. 250-211.00J.

Gehlen, Gary N., to Stayton Canning Company Cooperative. Cauliflower size cutter. 4,420,118., Cl. 241-101.200.

Geiger, Rolf; Konig, Wolfgang; and Johnscher, Gerd, to Hoechst Aktiengesellschaft. New peptides and a process for their preparation. 4,420,424., Cl. 260-112.50R.

Geiger, William J.: *See*—
Moriarity, Thomas C.; and Geiger, William J., 4,420,574., Cl. 523-404.000.

Gelston, N. E., II. Leak detector. 4,419,883., Cl. 73-49.300.

Gemma, Kazutoshi; and Hashimoto, Noriaki, to Hitachi, Ltd. Pulse train producing apparatus. 4,420,696., Cl. 307-262.000.

General Battery Corporation: *See*—
Eberle, William J., 4,420,673., Cl. 219-78.160.

General Electric Company: *See*—
Breen, Thomas B., 4,420,789., Cl. 361-94.000.
Chandran, Prem G. N.; and Matulevich, Edward S., 4,420,713., Cl. 318-71.000.
D'Atre, John D.; and Walker, Loren H., 4,420,719., Cl. 318-803.000.
Dunlap, Thomas G.; Jameson, William G., Jr.; Mefford, Carl R.; Nelson, Harold L.; and Cearley, James E., 4,420,458., Cl. 376-447.000.
Kimberlin, Dan W., 4,420,705., Cl. 310-242.000.
Miller, Edward H., 4,420,161., Cl. 277-56.000.
Qurnell, Frank D.; and Skarshaug, Nordahl H., 4,420,455., Cl. 376-245.000.
Reiling, Gilbert H.; Putz, John M.; and Van Horn, David D., 4,420,801., Cl. 362-297.000.
Van Horn, David D., 4,420,800., Cl. 362-297.000.
Wilkinson, Stanley B.; and Alexander, George E., 4,420,788., Cl. 361-85.000.

General Equipment Co.: *See*—
von Ruden, Dennis, 4,420,189., Cl. 299-40.000.

General Motors Corporation: *See*—
Christen, Eugene W., 4,420,195., Cl. 308-201.000.
Kondziola, Joseph D.; and Sobieski, Donald C., 4,420,127., Cl. 242-107.40A.
Lee, Michael C. H.; and Nelson, Darrel S., 4,420,585., Cl. 524-548.000.
Wysocki, Thomas J., 4,420,170., Cl. 280-661.000.

General Research of Electronics, Inc.: *See*—
Imazeki, Kazuyoshi; and Nakano, Masao, 4,420,716., Cl. 318-379.000.

General Signal Corporation: *See*—
Bogenschutz, Thomas M., 4,420,066., Cl. 188-107.000.
Hasserjian, Simon, 4,419,814., Cl. 29-605.000.

General Technology Applications, Inc.: *See*—
Weitzen, William, 4,420,400., Cl. 210-710.000.

General Tire & Rubber Company, The: *See*—
Ayers, Myron T., 4,420,453., Cl. 264-502.000.

Gentiluomo, Joseph A., to United States of America, Army. Hydrodynamic pressurizing apparatus. 4,419,881., Cl. 73-37.000.

George Fischer Ltd.: *See*—
Rohr, Jakob, 4,420,190., Cl. 301-63.00R.

Gerberich, H. Robert; and Smith, Eldred T., to Celanese Corporation. Formaldehyde production. 4,420,641., Cl. 568-473.000.

Gerch, Edward L., to Kingport, Ltd. Combination carrying case and detachable garment carrier. 4,420,068., Cl. 190-102.000.

Gerharz, Reinhold, to United States of America, Army. Switchable on-axis optical bandstop filter. 4,420,217., Cl. 350-362.000.

Gettert, Hans; and Kaempfer, Knut, to BASF Aktiengesellschaft. Method of prevention of deposits in the pipes of waste heat boilers. 4,420,342., Cl. 134-3.000.

Ghezzi, Roberto: *See*—
Canavesi, Roberto; Aglietti, Giancarlo; and Ghezzi, Roberto, 4,420,421., Cl. 502-316.000.

Ghilardi, Ciuliano; and Maiocchi, Luigi, to Industrie Pirelli S.p.A. Annular reinforcing structure of radial tires. 4,420,025., Cl. 152-361.0DM.

Gibson, Jack E. Powder coating the interior of pipe. 4,420,508., Cl. 427-183.000.

Gidge, Kenneth N.; and Richard, Henry J., to BSL Corporation. Transparent access curtain for coolers and the like. 4,420,027., Cl. 160-328.000.

Gill, Gary W.: *See*—
Coke, Harry E.; and Gill, Gary W., 4,420,513., Cl. 427-407.100.

GKN Technology Limited: *See*—
Marsh, Barry J., 4,420,450., Cl. 264-118.000.

Glacier GmbH-DEVA Werke: *See*—
Lichtinghagen, Klaus, 4,420,294., Cl. 425-79.000.

Glantz, Jerome J., to Lamb-Weston, Inc. Process for making skin-on potato boats. 4,420,494., Cl. 426-441.000.

Glass, Frank S.: *See*—
Hernandez, Rafael; Chow, Edmund E.; Moncrief, Marion L., Jr.; and Glass, Frank S., 4,420,810., Cl. 364-509.000.

Glasteel Tennessee, Inc.: *See*—
Barrell, David; Kennedy, Donald E.; Marino, James J., Jr.; and Rollen, Donald C., 4,420,509., Cl. 427-206.000.

Gliniorz, Lothar; Dobler, Peter; Schoettle, Klaus; Flohr, Joachim; and Maerthesheimer, Rolf, to BASF Aktiengesellschaft. Container for tape-like material. 4,420,079., Cl. 206-387.000.

Glory Kogyo Kabushiki Kaisha: *See*—
Kobayashi, Tetsuji, 4,420,151., Cl. 271-263.000.

Gluza, Roland, to Regie Nationale Des Usines Renault. Modular device for automatic dimensional gauging of rotation parts. 4,419,827., Cl. 33-174.00L.

Goiseau, Pierre A., to Societe de Mecanique General - Goiseau Guittot. Machine for automatically fitting tires to rims. 4,420,026., Cl. 157-1.240.

Goldsworthy Engineering, Inc.: *See*—
Goldsworthy, William B., 4,420,359., Cl. 156-379.800.

Goldsworthy, William B., to Goldsworthy Engineering, Inc. Apparatus for producing fiber-reinforced plastic sheet structures. 4,420,359., Cl. 156-379.800.

Golke, Keith W.; Hendrickson, Thomas E.; and Huang, Charles C., to Honeywell Inc. High sensitivity variable capacitance transducer. 4,420,790., Cl. 361-283.000.

Goloff, Alexander, to Caterpillar Tractor Co. Variable rate valve spring. 4,420,141., Cl. 251-337.000.

Goma, Yasuo: *See*—
Shiga, Shoji; Suzuki, Akitoshi; Goma, Yasuo; and Kawada, Kenji, 4,420,377., Cl. 204-28.000.

Goodin, William K. Multi-trailer assembly. 4,420,165., Cl. 280-414.100.

Goodman, Thomas P.; Yin, Chieh-Kung; and Kosrow, Robert L., to Union Special Corporation. Fabric aligning method and apparatus. 4,419,949., Cl. 112-262.100.

Goodyear Tire & Rubber Company, The: *See*—
Burkholder, Ward J., 4,420,376., Cl. 203-29.000.

Goolsby, Alvin D.; and Hesselman, Ignatius A. M., to Shell Oil Company. Method for determination of internal pipeline or tubing corrosion. 4,419,892., Cl. 73-432.00R.

Goosen, Carl C. Carburetor throttle valve method and apparatus. 4,420,438., Cl. 261-65.000.

Gorgati, Romolo, to Owens-Corning Fiberglas Corporation. Bitumen, atactic polypropylene and propylene/ethylene copolymer compositions and water-proofing membranes using the same. 4,420,524., Cl. 428-110.000.

Gorman, William G.; and Popp, Karl F., to Sterling Drug Inc. Basic amino or ammonium antimicrobial agent-polyethylene glycol ester surfactant-betaine and/or amine oxide surfactant compositions and method of use therof. 4,420,484., Cl. 424-326.000.

Gorondy, Emery J., to Du Pont de Nemours, E. I., and Company. Printing process. 4,420,307., Cl. 8-444.000.

Gortat, Zenon: *See*—
Skolik, Wojciech; Wodecki, Jozef; Gortat, Zenon; Szyngiel, Stanislaw; Bulenda, Andrzej; and Sopora, Piotr, 4,420,075., Cl. 198-735.000.

Goryaev, German A.: *See*—
Belkin, German S.; Voskresensky, Stal N.; Kiselev, Viktor Y.; Lukatskaya, Ida A.; Rodionov, Valery V.; Skurikhin, Mikhail N.; Frolova, Irina B.; Zuev, Vyacheslav S.; Kornevv, Lev I.; Chervonenkis, Rauza A.; Rabinovich, Efim M.; Volkova, Tatyana P.; and Goryaev, German A., 4,420,346., Cl. 148-4.000.

Goto, Kunio: *See*—
Ogawa, Masahide; Masuko, Tetsuo; Goto, Kunio; Sugai, Hideo; and Takahashi, Masao, 4,420,419., Cl. 252-455.00Z.

Goto, Tokuju: *See*—
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,419,869., Cl. 68-5.00D.

Gottschalk, Robert E., to Panavision, Incorporated. Motion picture camera. 4,420,231., Cl. 352-142.000.

Gougeon Brothers, Inc.: *See*—
Gougeon, Meade A.; and Gougeon, Jan C., 4,420,354., Cl. 156-242.000.

Gougeon, Jan C.: *See*—
Gougeon, Meade A.; and Gougeon, Jan C., 4,420,354., Cl. 156-242.000.
Gougeon, Meade A.; and Gougeon, Jan C., to Gougeon Brothers, Inc. Process for securing projecting studs in the ends of wood resin composite bodies and the like and the structure formed thereby. 4,420,354., Cl. 156-242.000.
Gournay, Luke S., to Mobil Oil Corporation. Distinguishing true basement from dikes and sills encountered in drilling of a borehole through the earth. 4,419,887., Cl. 73-152.000.
Grabatsch, Franz: *See*—
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860., Cl. 57-22.000.
Grabbe, Dimitry G., to AMP Incorporated. Method for manufacturing substrate with selectively trimmable resistors between signal leads and ground structure. 4,419,818., Cl. 29-832.000.
Graham, Marshall D.: *See*—
Newton, William A.; and Graham, Marshall D., 4,420,720., Cl. 324-71.400.
Gray, Reed A., to Stauffer Chemical Company. Herbicidal antidotes. 4,420,322., Cl. 71-82.000.
Greck, Edward T.; and Neat Products, Inc. Meat support and method of use. 4,420,493., Cl. 426-420.000.
Green, Keith, to Burroughs Corporation. Disc mounting and centering device. 4,420,830., Cl. 369-261.000.
Green, William R.: *See*—
Schiebold, Cristopher F.; and Green, William R., 4,420,731., Cl. 333-219.000.
Grenci, Carl A., deceased; and by Jordan, William C., executor, to La Nora J. Grenci. Test head for compressed gas cylinders. 4,419,884., Cl. 73-49.800.
Greten, Berndt: *See*—
Neubauer, Harry; Greten, Berndt; and Seeger, Gunter, 4,420,357., Cl. 156-274.600.
Griffin, Gerald J. L., to Coloroll Limited. Plastics based composition containing a polyester resin and alkaline modified starch granules. 4,420,576., Cl. 524-47.000.
Griffith, Harold, to Griffith, Harold. Furniture suspension system. 4,419,778., Cl. 5-244.000.
Gronchi, Paolo: *See*—
Codignola, Franco; Gronchi, Paolo; del Rosso, Renato; and Centola, Paolo, 4,420,634., Cl. 562-512.200.
Grosskopf, Rudolf, to Carl-Zeiss-Stiftung. Method and apparatus for the detection of accumulations of particles such as metaphase plates. 4,420,768., Cl. 358-107.000.
Grosskuchenanlagen Ing. Josef Hammer: *See*—
Hammer, Josef; Schiel, Lothar; and Kratt, Hans, 4,420,495., Cl. 426-564.000.
Grossmann, Max: *See*—
Opitz, Konrad; Grossmann, Max; Kruse, Hurbert; Schneider, Manfred; and Uhrig, Heinz, 4,420,310., Cl. 8-560.000.
Gruber, Werner, to Henkel Kommanditgesellschaft auf Aktien. (Meth-)acrylates of isocyanuric acid derivatives containing hydroxyl groups and their use as adhesives. 4,420,597., Cl. 526-261.000.
Grutzediek, Hartmut; Scheerer, Joachim; Knothe, Erich; and Melcher, Franz-Josef. Apparatus for measuring weight and force. 4,420,055., Cl. 177-212.000.
Gryphon Products: *See*—
Hartsough, Larry D., 4,420,385., Cl. 204-192.00R.
GTE Products Corporation: *See*—
Leong, Henry, 4,420,204., Cl. 339-63.00R.
Mizuhara, Howard, 4,420,459., Cl. 419-61.000.
Rattray, Kendrick D., 4,420,709., Cl. 313-486.000.
Shaffer, John W., 4,420,301., Cl. 431-359.000.
Guenther, Charles J.: *See*—
Aug, Conrad J.; Guenther, Charles J.; and Randolph, James B., 4,420,203., Cl. 339-17.0CF.
Gunn, John A.: *See*—
Wiley, Walter H., III; and Gunn, John A., 4,420,834., Cl. 372-35.000.
Gustafson, Manfred, to Seco Tools Aktiebolag. Tool block. 4,420,280., Cl. 407-109.000.
Gutierrez, Eddie N.; and Lamberti, Vincent, to Lever Brothers Company. Preparation of polycarboxylic compounds. 4,420,621., Cl. 549-322.000.
Gutmanis, Feliks: *See*—
Chen, Shao L.; and Gutmanis, Feliks, 4,420,563., Cl. 435-245.000.
H.D. Research Company: *See*—
Strain, Don R., 4,419,835., Cl. 34-80.000.
Haas, John F.: *See*—
Jones, Wallace R.; Krieger, Paul A.; and Haas, John F., 4,420,520., Cl. 428-42.000.
Haberkorn, Joseph: *See*—
Wieder, Horst K.; Wieder, Klaus A.; and Haberkorn, Joseph, 4,420,446., Cl. 264-40.600.
Hackett, Brian K., to Minnesota Mining & Manufacturing Co. Method and device for frequency translation. 4,420,831., Cl. 370-50.000.
Hada, Michio; Shiraishi, Yoshihiro; Hino, Masao; and Seto, Toru, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for dust removal from solid-gas contact reactor. 4,420,313., Cl. 55-96.000.
Haga, Takahiro: *See*—
Yokomichi, Isao; Haga, Takahiro; Nasu, Rikuo; Nagatani, Kuniaki; and Nakajima, Toshio, 4,420,618., Cl. 546-345.000.
Hagens, Rodger G.; and Hui, Dominic K., to Diversey Corporation. Surface treatment of glass containers. 4,420,578., Cl. 524-322.000.
Haghiri-Tehrani, Yahya: *See*—
Hoppe, Joachim; and Haghiri-Tehrani, Yahya, 4,420,683., Cl. 235-492.000.
Hagiwara, Muneaki: *See*—
Makabe, Hachiro; Hagiwara, Muneaki; and Tanaka, Haruhiko, 4,419,947., Cl. 112-158.00E.
Hajek, Rosemary T. Disposable shampoo basin. 4,419,774., Cl. 4-516.000.
Hale, David C., to Scale-Tronix, Inc. Patient weighing scale. 4,420,052., Cl. 177-132.000.
Hale, William J.: *See*—
Paganini, Bruno J.; and Hale, William J., 4,420,751., Cl. 340-825.330.
Halex, Inc.: *See*—
Gartner, William J., 4,420,590., Cl. 525-357.000.
Hall, Byron C.: *See*—
Knox, William J.; and Hall, Byron C., 4,420,147., Cl. 270-37.000.
Hall, John S.: *See*—
Phelps, Barry C.; and Hall, John S., 4,420,174., Cl. 283-75.000.
Hallburg, Wayne A. Boat-canopy for truck beds. 4,420,181., Cl. 296-157.000.
Halliburton Company: *See*—
Arbasak, David P.; and Blake, David L., 4,420,040., Cl. 166-70.000.
McMahan, Michael E., 4,420,045., Cl. 166-334.000.
Hamada, Hiroshi: *See*—
Koyanagi, Katubumi; Hamada, Hiroshi; Yano, Kohzo; Take, Hiroshi; and Inami, Yasuhiko, 4,420,749., Cl. 340-763.000.
Hamada, Masa: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; and Ishii, Kiyoto, 4,420,473., Cl. 424-118.000.
Hamada, Shinobu J.; and Yodokawa, Taro, to TRW Inc. Multi-mode tracking antenna feed system. 4,420,756., Cl. 343-16.00M.
Hamada, Toshiyoshi: *See*—
Tsuji, Nobuhiko; Nakamura, Keijiroh; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, 4,420,564., Cl. 435-288.000.
Hament, Erwin. Cup and cover combination. 4,420,111., Cl. 229-7.0SC.
Hammer, Josef; Schiel, Lothar; and Kratt, Hans, to Grosskuchenanlagen Ing. Josef Hammer. Method and apparatus for preparing foamy sauces or the like. 4,420,495., Cl. 426-564.000.
Hammond, Kenneth G.; Sendra, Joseph C.; Watts, Lewis W., Jr.; Marquis, Edward T.; and Larkin, John M., to Texaco Inc. Semi-synthetic lubricating oil composition. 4,420,647., Cl. 585-10.000.
Hamunen, Antti, to OY Kaukus AB. Process for the separation of sterols or mixtures of sterols. 4,420,427., Cl. 260-397.250.
Hanari, Tohru: *See*—
Sato, Akihiro; Kikuta, Kazutsune; Matsuda, Kenji; Uwai, Toshihiro; and Hanari, Tohru, 4,420,593., Cl. 526-128.000.
Hannesen, Kurt: *See*—
Bergner, Dieter; Hannesen, Kurt; Schulte, Wilfried; and Steinmetz, Peter, 4,420,387., Cl. 204-263.000.
Hanowich, Peter J., to Rockwell International Corporation. Apparatus for calibrating fluid flow meters utilizing digital techniques. 4,419,880., Cl. 73-3.000.
Hans Kaufeld GmbH & Co.: *See*—
Vogt, Wilhelm, 4,420,186., Cl. 297-284.000.
Hansen, Herbert: *See*—
Hoffmann, Rudolf; Zajber, Adolf G.; and Hansen, Herbert, 4,420,837., Cl. 373-78.000.
Hanson, Harold W., Jr.; and Munhofen, Cody, to Par Way Manufacturing Co. Low temperature release agent compositions particularly useful for frozen food products. 4,420,496., Cl. 426-609.000.
Hanson, James M.; and Schlichting, Robert, to Wide One Corporation. Invalid lift apparatus. 4,420,286., Cl. 414-539.000.
Harayama, Akira: *See*—
Kondo, Katsumi; Fuwa, Yoshio; Harayama, Akira; and Nakahora, Toru, 4,420,543., Cl. 428-564.000.
Hardin, Jasper E.: *See*—
Rorer, David L.; and Hardin, Jasper E., 4,419,815., Cl. 29-623.200.
Harigae, Makoto: *See*—
Oka, Koichiro; Tanaka, Hiroshi; and Harigae, Makoto, 4,420,366., Cl. 156-644.000.
Harigae, Shunji: *See*—
Yoshida, Tomio; Nagashima, Michiyoshi; Harigae, Shunji; Ichinose, Makoto; and Wakami, Noboru, 4,420,828., Cl. 369-47.000.
Harigaya, Isao: *See*—
Ogawa, Yukio; Harigaya, Isao; Yamada, Tateo; and Hirohata, Michio, 4,420,237., Cl. 354-458.000.
Harima, Hiroshi: *See*—
Yoshioka, Yoshihiro; and Harima, Hiroshi, 4,420,588., Cl. 525-93.000.
Harner, Kermit I.: *See*—
Kos, Joseph M.; Patrick, John P.; and Harner, Kermit I., 4,420,692., Cl. 290-44.000.
Harper, Lawrence L., to United States of America, National Aeronautics and Space Administration. Laser resonator. 4,420,836., Cl. 372-98.000.
Harris Corporation: *See*—
Johnson, Mize, Jr.; and Miller, Harold J., 4,420,806., Cl. 364-200.000.
Kasten, Alan J., 4,420,766., Cl. 357-59.000.
Harris, David, to Black & Decker Inc. Bump-feed trimmer. 4,419,822., Cl. 30-276.000.

Harris, Joanne L.: *See*—
Reckel, Rudolph P.; and Harris, Joanne L., 4,420,461., Cl. 422-61.000.

Harris, Robert S., to Stant Inc. Fuel-water separator with flow-reduction feature. 4,420,392., Cl. 210-86.000.

Harris, William J. Line string block attachment. 4,420,143., Cl. 254-134.3PA.

Hartel, Gunter; Schurfeld, Armin; and Abidin, Anwar, to Bosch & Pierburg System oHG. Constant pressure carburettors. 4,420,439., Cl. 261-142.000.

Hartmann, Randolph; and Schriewer, Helmut, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Method of biologically drying waste material. 4,420,320., Cl. 71-13.000.

Hartsough, Larry D., to Gryphon Products. Apparatus and process for sputter deposition of reacted thin films. 4,420,385., Cl. 204-192.00R.

Hashida, Wataru: *See*—
Matsuo, Takaharu; Sawamura, Norio; Hashimoto, Yukio; and Hashida, Wataru, 4,420,560., Cl. 435-134.000.

Hashimoto, Akio: *See*—
Ito, Tadao; and Hashimoto, Akio, 4,420,345., Cl. 148-3.000.

Hashimoto, Noriaki: *See*—
Gemma, Kazutoshi; and Hashimoto, Noriaki, 4,420,696., Cl. 307-262.000.

Hashimoto, Yukio: *See*—
Matsuo, Takaharu; Sawamura, Norio; Hashimoto, Yukio; and Hashida, Wataru, 4,420,560., Cl. 435-134.000.

Hashiyama, Tomiki: *See*—
Inoue, Hirozumi; and Hashiyama, Tomiki, 4,420,628., Cl. 560-17.000.

Hashizume, Junji: *See*—
Ito, Yoshimasa; Hashizume, Junji; Ikeda, Junichi; Utsumi, Noriyuki; and Naka, Tesuyu, 4,420,812., Cl. 364-513.000.

Haslanger, Martin F.; and Sprague, Peter W., to E. R. Squibb & Sons, Inc. Dioxatricyclic prostacyclin analogs. 4,420,626., Cl. 549-386.000.

Hasserjian, Simon, to General Signal Corporation. Method of making a bobbin construction for autotransformer ballast. 4,419,814., Cl. 29-605.000.

Hatano, Yoshihiro: *See*—
Ikegami, Seishi; and Hatano, Yoshihiro, 4,420,616., Cl. 546-5.000.

Hatley, Kenneth J.: *See*—
Preiser, Herman S.; Ticker, Arthur; and Hatley, Kenneth J., 4,420,533., Cl. 428-351.000.

Hattori, Shuzo; Kamide, Noboru; Tokudome, Katsumi; Ishikawa, Michio; and Hayashi, Yuji, to Kimmon Electric Co., Ltd. Hollow cathode laser. 4,420,835., Cl. 372-88.000.

Hattori, Tadashi; Yoshida, Hitoshi; Akutagawa, Keichi; Takata, Akira; and Fukuda, Tamotsu, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air-fuel intake system for an internal combustion engine. 4,419,972., Cl. 123-337.000.

Hauni-Werke Korber & Co. KG.: *See*—
Hausler, Nikolaus; and Mallon, Klaus-Dieter, 4,420,073., Cl. 198-347.000.

Hausler, Nikolaus; and Mallon, Klaus-Dieter, to Hauni-Werke Korber & Co. KG. Apparatus for transferring rod-shaped articles from a source of supply into the flutes of a conveyor. 4,420,073., Cl. 198-347.000.

Hawerkamp, Manfred. Device for cooling and calibrating helical thermoplastic tube ribs. 4,420,037., Cl. 165-46.000.

Haws, Ben E.: *See*—
Vandenberg, August; Vandenberg, Ben W.; Vandenberg, Andrew W.; and Haws, Ben E., 4,419,961., Cl. 119-14.030.

Hayama, Masashi; Saguchi, Hiroto; and Hirabayashi, Kenji, to TDK Electronics Co. Ltd. Magnetic recording medium having cobalt adsorbed iron oxide layer. 4,420,537., Cl. 428-403.000.

Hayashi, Yoshihiro: *See*—
Moriya, Shigeru; Yosida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Katsuno, Mitsuaki, 4,420,173., Cl. 280-804.000.

Hayashi, Yuji: *See*—
Hattori, Shuzo; Kamide, Noboru; Tokudome, Katsumi; Ishikawa, Michio; and Hayashi, Yuji, 4,420,835., Cl. 372-88.000.

Hayashida, Masayoshi: *See*—
Omote, Kazuaki; and Hayashida, Masayoshi, 4,420,057., Cl. 180-54.00A.

Hazeltine Corporation: *See*—
Loughlin, Bernard D., 4,420,658., Cl. 381-15.000.

Hearne, Keith M. T. Respiratory measuring devices. 4,420,001., Cl. 128-724.000.

Heath, Roger L., to R2 Corporation. Physiological electrode systems. 4,419,998., Cl. 128-639.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Phosphonopolyester resin. 4,420,587., Cl. 525-39.000.

Hegner, Gunter; and Herfort, Hermann, to Krone GmbH. Plug-in connector with arresters for separating blocks. 4,420,792., Cl. 361-331.000.

Heinisch, Peter: *See*—
von der Eltz, Hans-Ulrich; Heinisch, Peter; and Ballmann, Hans J., 4,420,309., Cl. 8-555.000.

Hell, Gunter: *See*—
Schutt, Eduard; and Hell, Gunter, 4,419,913., Cl. 83-27.000.

Hendrickson, Thomas E.: *See*—
Golke, Keith W.; Hendrickson, Thomas E.; and Huang, Charles C., 4,420,790., Cl. 361-283.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Gruber, Werner, 4,420,597., Cl. 526-261.000.

Hephaist Seiko Co.: *See*—
Asami, Kanji, 4,420,194., Cl. 308-6.00C.

Herbold, Ted E. Tiltable reclining and seating device. 4,419,989., Cl. 128-74.000.

Hercules Incorporated: *See*—
Scheve, Bernard J., 4,420,611., Cl. 536-88.000.

Herfort, Hermann: *See*—
Hegner, Gunter; and Herfort, Hermann, 4,420,792., Cl. 361-331.000.

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Gemma, Kazutoshi; and Hashimoto, Noriaki, 4,420,696., Cl. 307-262.000.

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Okouchi, Isao; Takahashi, Sankichi; Mukai, Yasuteru; Otake, Katsumoto; Sasaki, Takuya; and Miyai, Masahiko, 4,420,038., Cl. 165-95.000.
Sakai, Keijiro; Matsuda, Yasuo; and Honbu, Mitsuyuki, 4,420,718., Cl. 318-729.000.
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Ohtani, Tamio; and Kanaya, Yasuhiko, 4,420,685., Cl. 250-222.200.

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Takagi, Tomio; Ueda, Jitsuhiko; Fujii, Tadaomi; and Tanaka, Kazuhiko, 4,420,335., Cl. 75-124.000.

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Nickel, Walter; Schoening, Josef; and Schwiers, Hans-Georg, 4,420,456., Cl. 376-245.000.

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Diery, Helmut; and Hille, Martin, 4,420,413., Cl. 252-331.000.
Geiger, Rolf; Konig, Wolfgang; and Johnacher, Gerd, 4,420,424., Cl. 260-112.50R.
Horoldt, Ernst; Vollmuller, Helmut; Bernhard, Heinz D.; and Strobel, Harald M., 4,420,572., Cl. 523-322.000.
Opitz, Konrad; Grossmann, Max; Kruse, Hurbert; Schneider, Manfred; and Uhrig, Heinz, 4,420,310., Cl. 8-560.000.
von der Eltz, Hans-Ulrich; Heinisch, Peter; and Ballmann, Hans J., 4,420,309., Cl. 8-555.000.

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Davis, Larry; and Pierrat, Frank A., 4,420,485., Cl. 424-267.000.

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Bolhofer, William A.; Cragoe, Edward J.; and Hoffman, Jacob M., Jr, 4,420,615., Cl. 544-279.000.

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Ohyama, Hiroshi; Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Takada, Sanae; Morita, Ken; Wada, Takuo; Miyahara, Masahiko; and Arakawa, Masazumi, 4,420,486., Cl. 424-272.000.

Holbert, Don R. Directional drilling method and apparatus. 4,420,049., Cl. 175-45.000.

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Holland-Letz, Gunter, to Esselte Pendaflex Corporation. Hand labelling apparatus. 4,419,930., Cl. 101-93.180.

Holland, Robert H.: *See*—
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Holmes, Martin J.: *See*—
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Holstead, Colin: *See*—
Booms, Robert E.; and Holstead, Colin, 4,420,556., Cl. 430-549.000.

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Wise, Joseph F.; and Holt, James F., 4,420,650., Cl. 136-255.000.

Holt, Walter L., Sr.: *See*—
Walker, Charles B.; and Holt, Walter L., Sr., 4,420,089., Cl. 215-216.000.

Holtz, R. Barry, to Spawn Mate, Inc. Mushroom growth enhancers and method for preparing same. 4,420,319., Cl. 71-5.000.

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Lohnherr, Ludger; and Holz, Walter, 4,420,064., Cl. 184-1.00C.

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Sakai, Keijiro; Matsuda, Yasuo; and Honbu, Mitsuyuki, 4,420,718., Cl. 318-729.000.

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Broden, David E.; and Martwick, Wilford E., 4,419,796., Cl. 29-1.230.
Golke, Keith W.; Hendrickson, Thomas E.; and Huang, Charles C., 4,420,790., Cl. 361-283.000.
Krueger, James H., 4,420,736., Cl. 337-340.000.

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House, Roy F.; and Hoover, Lonnie D., 4,420,406., Cl. 252-8.55R.

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Horoldt, Ernst; Vollmuller, Helmut; Bernhard, Heinz D.; and Strobel, Harald M., to Hoechst Aktiengesellschaft. Continuous process for the production of highly concentrated spinning solutions of acrylonitrile polymers and a suitable device for this purpose. 4,420,572., Cl. 523-322.000.

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Hostetler, Ronald E., to Crown Zellerbach Corporation. High bulk papermaking system. 4,420,372., Cl. 162-280.000.

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Howland, Leland L., to Thermo King Corporation. Transport refrigeration system control. 4,419,866., Cl. 62-228.400.

Hrdina, Jan: *See*—
Spacek, Jindrich; Smrcek, Vaclav; Voda, Karel; Kosek, Jiri; Hrdina, Jan; and Penaz, Vaclav, 4,419,876., Cl. 72-57.000.

Huang, Chan-Shiung. Alternatively swinging and twisting toy. 4,419,841., Cl. 46-105.000.

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Hagens, Rodger G.; and Hui, Dominic K., 4,420,578., Cl. 524-322.000.

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Humphrey, William E., 4,420,228., Cl. 351-212.000.

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Hungerford, Gordon P., to Mobil Oil Corporation. Polymer film treatment with organic impregnant. 4,420,514., Cl. 427-430.100.

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Riggs, Robert R.; and Hunt, Paulmer D., 4,420,014., Cl. 137-468.000.

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Hutton, Thomas W., to Rohm and Haas Company. Acid containing emulsion copolymer crosslinked by a halohydroxypropyl ammonium salt solution polymer. 4,420,583., Cl. 524-501.000.

Hyatt, Charles J., to PPG Industries, Inc. Method of and apparatus for damage-free scoring of refractory material. 4,420,106., Cl. 225-2.000.

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Icarus, Inc.: *See—*
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Ichihara, Yutaka: *See—*
Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; and Miyaji, Akira, 4,420,773., Cl. 358-335.000.

Ichinose, Makoto: *See—*
Yoshida, Tomio; Nagashima, Michiyoshi; Harigae, Shunji; Ichinose, Makoto; and Wakami, Noboru, 4,420,828., Cl. 369-47.000.

ICI Australia Limited: *See—*
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Idemitsu Kosan Company Limited: *See—*
Seki, Kenji; and Terada, Eiichi, 4,420,599., Cl. 526-318.000.

Iijima, Nobuo: *See—*
Watanabe, Yoshio; and Iijima, Nobuo, 4,420,223., Cl. 350-310.000.

Ijiri, Ryuzo: *See—*
Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dentaro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332., Cl. 75-26.000.

Ikeda, Junichi: *See—*
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Kirby, Ian J.; Mitchell, Michael I.; and Stratton, Andrew, 4,419,933., Cl. 102-206.000.

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Whittam, Thomas V., 4,420,467., Cl. 423-328.000.

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Yamaura, Mitsuru; Kondow, Ryotaro; and Inagaki, Junichi, 4,420,805., Cl. 364-184.000.

Inami, Yasuhiko: *See—*
Koyanagi, Katubumi; Hamada, Hiroshi; Yano, Kohzo; Take, Hiroshi; and Inami, Yasuhiko, 4,420,749., Cl. 340-763.000.

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Chang, Ching-Te; Lee, Lian-Tze; and Su, Hsueh-Ling, 4,420,430., Cl. 260-429.00R.

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Ghilardi, Giuliano; and Maiocchi, Luigi, 4,420,025., Cl. 152-361.0DM.

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Hartmann, R.ndolph; and Schriewer, Helmut, 4,420,320., Cl. 71-13.000.
Zimmer, Ernst, 4,419,831., Cl. 33-181.00R.

Ingalls, William E.; and O'Rourke, Thomas W. Method and structure for bearing the eccentricity of a bushing bore. 4,420,272., Cl. 403-4.000.

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Lawson, Daniel D.; and Ingham, John D., 4,420,544., Cl. 429-13.000.

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Inoue, Hirozumi; and Hashiyama, Tomiki, to Tanabe Seiyaku Co., Ltd. Process for preparing threo-2-hydroxy-3-(4-methoxyphenyl)-3-(2-nitrophenylthio)-propionic ester. 4,420,628., Cl. 560-17.000.

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Onoguchi, Akira; Miyazawa, Mitsuhisa; Yamazaki, Shigetomo; and Inoue, Masahiro, 4,420,686., Cl. 250-310.000.

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Rubanov, Alexandr S.; Tanin, Leonid V.; Vasilieva, Ljudmila V.; Kalinin, Anatoly N.; Bursky, Vyacheslav A.; and Vidmant, Felix V., 4,420,218., Cl. 350-3.850.

Interface, Inc.: *See—*
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Argumedo, Armando J.; Chow, William W.; Freeman, Robert D.; and Kleczkowski, Stawomir P., 4,420,782., Cl. 360-129.000.
Deckert, Kenneth L., 4,420,780., Cl. 360-103.000.
Jove, Stephen A.; and Vaughn, Julian E., 4,420,776., Cl. 360-45.000.

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Aug, Conrad J.; Guenther, Charles J.; and Randolph, James B., 4,420,203., Cl. 339-17.0CF.
Francis, David B., 4,420,815., Cl. 364-724.000.
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Nolta, Arthur H.; and Reed, David G., 4,420,807., Cl. 364-200.000.
Riseman, Jacob; and Tsang, Paul J., 4,419,809., Cl. 29-571.000.
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Boden, Richard M.; and Tyszkiewicz, Theodore J., 4,420,411., Cl. 252-174.110.
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,420,423., Cl. 252-522.00R.
Boden, Richard M.; Vock, Manfred H.; and Tyszkiewicz, Theodore J., 4,420,472., Cl. 424-58.000.

International Playtex, Inc.: *See—*
Cole, Raymond; Kennedy, Raymond; and McCluskey, Lincoln, 4,419,997., Cl. 128-489.000.

Interpace Corporation: *See—*
McWhirter, Carson H., 4,419,785., Cl. 16-1.00R.

Ireland, Irving R.: *See—*
Kretas, George A.; and Ireland, Irving R., 4,420,401., Cl. 210-714.000.

Isartaler Schraubenkompressoren GmbH: *See—*
Hofmann, Rudolf, 4,420,293., Cl. 418-47.000.

Iseki, Junkichi: *See—*
Silvilotti, Olivo G.; and Iseki, Junkichi, 4,420,381., Cl. 204-70.000.

Ishida, Keiichi: *See—*
Tsuji, Nobuhiko; Nakamura, Keijiroh; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, 4,420,564., Cl. 435-288.000.

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Ishidoshiro, Hiroshi: *See—*
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,419,869., Cl. 68-5.00D.

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Yokomichi, Isao; Haga, Takahiro; Nasu, Rikuo; Nagatani, Kuniaki; and Nakajima, Toshio, 4,420,618., Cl. 546-345.000.

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Ishii, Kiyoto: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; and Ishii, Kiyoto, 4,420,473., Cl. 424-118.000.

Ishii, Masami: *See—*
Yamamoto, Yasunobu; Tomikawa, Ryoichi; and Ishii, Masami, 4,420,067., Cl. 188-251.00A.

Ishikawa, Hiromichi: *See—*
Ohyama, Hiroshi; Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Takada, Sanae; Morita, Ken; Wada, Takuo; Miyahara, Masahiko; and Arakawa, Masazumi, 4,420,486., Cl. 424-272.000.

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Sueyoshi, Susumu; and Ishikawa, Kikuo, 4,420,725., Cl. 330-288.000.

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Hattori, Shuzo; Kamide, Noboru; Tokudome, Katsumi; Ishikawa, Michio; and Hayashi, Yuji, 4,420,835., Cl. 372-88.000.

Ishikawa, Shozo: *See—*
Sakai, Kiyoshi; Mabuchi, Minoru; Suzuki, Toshiko; Egarashi, Yuji; and Ishikawa, Shozo, 4,420,548., Cl. 430-59.000.

Ishino, Kunihiro: *See—*
Ishiwata, Hideyuki; and Ishino, Kunihiro, 4,420,069., Cl. 192-35.000.

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Takahashi, Atsushi; Muratsubaki, Yoshiharu; and Ishizaka, Hiroyuki, 4,420,333., Cl. 75-55.000.

Isobe, Takashi: *See—*
Katsuma, Makoto; Mizogui, Toyokazu; Isobe, Takashi; Hiramatsu, Akira; Murakami, Hiroyasu; and Ishida, Toyoki, 4,420,240., Cl. 354-288.000.

Italimpianti Societa Italiana impianti, p.A.: *See—*
Martini, Iacopo, 4,420,145., Cl. 266-90.000.

Item Products Limited: *See—*
Taylor, Gerald M.; and Emms, Norman R., 4,420,178., Cl. 294-158.000.

Ito, Hiroshi: *See—*
Chibata, Ichiro; Sumi, Akihiko; Ito, Hiroshi; Ohtsuki, Osamu; and Izutsu, Nozomu, 4,420,432., Cl. 260-501.110.

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Kuroda, Yoshimi; Ito, Shichinosuke; Midorikawa, Akio; and Terashima, Kuniomi, 4,420,601., Cl. 528-76.000.
Ito, Shoichi: *See*—
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Nakatani, Genji; Kanai, Kazuo; Itoh, Haruo; Takasaki, Yasuto; Ohkoshi, Kenji; and Yanagida, Yoshinobu, 4,420,304., Cl. 432-83.000.
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Belikov, Viktor T.; Ivlev, Anatoly D.; Sitnichenko, Valentin M.; Shveta, Vladimir I.; and Bushtian, Leonid V., 4,420,712., Cl. 318-41.000.
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Herst, Douglas J.; and Iwahashi, Henry H., 4,420,798., Cl. 362-147.000.
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Iwane, Yasuhiko, to Alps Electric Co., Ltd. Serial printer. 4,420,267., Cl. 400-149.000.
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Wason, Satish K., 4,420,312., Cl. 51-308.000.
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Jackson, Delbert D., to Beckman Instruments, Inc. Method and apparatus for detecting insufficient liquid levels. 4,419,903., Cl. 73-864.010.
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James, Kenneth A.; Quick, William H.; August, Rudolf R.; and Strahan, Virgil H., to Rockwell International Corporation. Optical deformation sensor. 4,420,251., Cl. 356-32.000.
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Dunlap, Thomas G.; Jameson, William G., Jr.; Mefford, Carl R.; Nelson, Harold L.; and Cearley, James E., 4,420,458., Cl. 376-447.000.
Janesh, Larry. Pillow construction and method. 4,419,779., Cl. 5-490.000.
Janome Sewing Machine Co., Ltd.: *See*—
Makabe, Hachiro; Hagiwara, Muneaki; and Tanaka, Haruhiko, 4,419,947., Cl. 112-158.00E.
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van de Moesdijk, Cornelis; and Janssen, Petrus H. J., 4,420,622., Cl. 549-326.000.
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De Mey, Jan R.; and Moeremans, Marc K. J. J., 4,420,558., Cl. 435-7.000.
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Jenkins, Ralph E.: *See*—
Bush, Darrell C.; and Jenkins, Ralph E., 4,419,879., Cl. 73-432.0PS.
Jennmar Corporation: *See*—
Calandra, Frank, Jr., 4,419,805., Cl. 29-458.000.
Jensen, Sverre. Apparatus for use in cleaning of silk screen printing frames. 4,420,004., Cl. 134-96.000.
Jesson, Joseph E., to Oak Industries Inc. Keyboard crosspoint encoder having N-key rollover. 4,420,744., Cl. 340-365.00E.
Jessop, Thomas C.; and De Jager, Donald, to Eastman Kodak Company. Method and apparatus for detecting sample fluid on an analysis slide. 4,420,566., Cl. 436-46.000.
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Dietrich, Michel J., 4,420,133., Cl. 246-167.00R.
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Jobst Institute, Inc.: *See*—
Mummert, Thomas A., 4,419,988., Cl. 128-24.00R.
Johns, Robert L. Article display devices. 4,420,087., Cl. 211-189.000.
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Johnson, Charles A. Stove. 4,419,942., Cl. 110-234.000.
Johnson, Hugh A., Sr. Self-irrigating, multi-tier vertical planter. 4,419,843., Cl. 47-82.000.
Johnson, Mize, Jr.; and Miller, Harold J., to Harris Corporation. Interrupt coupling and monitoring system. 4,420,806., Cl. 364-200.000.
Johnson, Vernon V. Horizontal silage unloader. 4,420,119., Cl. 241-101.700.
Joichi, Yoshiro: *See*—
Yokota, Teppei; and Joichi, Yoshiro, 4,420,694., Cl. 307-130.000.
Jolley, Michael E.: *See*—
Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., 4,420,568., Cl. 436-536.000.
Jones, James H., to Merck & Co., Inc. Hexahydronaphth[1,2-b]-1,4-oxazines. 4,420,480., Cl. 424-248.400.
Jones, Kenneth W., to Reed Rock Bit Company. Oil well drilling bit. 4,420,050., Cl. 175-374.000.
Jones, Wallace R.; Krieger, Paul A.; and Haas, John F., to Excello Specialty Company, The. Area coated paint mask and method. 4,420,520., Cl. 428-42.000.
Jongen, Rene: *See*—
Wilshire, Colin; and Jongen, Rene, 4,420,614., Cl. 544-163.000.
Jordan, Ernst G., to OBO Bettermann OHG. Procedure and device for welding studs and similar parts to a work piece. 4,420,674., Cl. 219-99.000.
Jordan, William C., executor: *See*—
Grenci, Carl A., deceased; and Jordan, William C., executor, 4,419,884., Cl. 73-49.800.
Joshua, Henry: *See*—
Albers-Schonberg, George; Joshua, Henry; and Lopez, Maria B., 4,420,491., Cl. 424-311.000.
Jossif, Jean A. M.: *See*—
Salle, Jacques E.; Jossif, Jean A. M.; Rathier, Gilbert J. M.; and Vales, Jean-Pierre, 4,420,832., Cl. 370-56.000.
Jove, Stephen A.; and Vaughn, Julian E., to International Business Machines. PSK Modulation in AC bias data recording. 4,420,776., Cl. 360-45.000.
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Hibbard, George A.; Morrison, Ward D.; and Lumbra, Ralph C., 4,420,277., Cl. 405-260.000.
Jud, Hans: *See*—
Dworak, Ulf; Jud, Hans; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,420,142., Cl. 251-368.000.
Juengst, Fred W., Jr.; and Dika, John A., to Calor Agriculture Research, Inc. Calcium ammonium lactate. 4,420,636., Cl. 562-589.000.
Julian, Kenneth A.: *See*—
Julian, Victor J.; and Julian, Kenneth A., 4,420,213., Cl. 339-116.00R.
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Jung, Friedrich: *See*—
Ackermann, Rolf; Jung, Friedrich; Mauer, Egon; and Rupertinger, Hermann, 4,420,269., Cl. 400-356.000.
Jurgen, Appenrodt, to Kienzle Apparate GmbH. Passive data display and method and means for control and monitoring thereof. 4,420,748., Cl. 340-715.000.
JWI Ltd.: *See*—
Saad, Nabil R., 4,420,370., Cl. 162-209.000.
Kabanov, Pavel S.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor

M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701., Cl. 310-54.000.

Kabelschlepp Gesellschaft mit beschrankter Haftung: *See*—
Moritz, Werner, 4,420,017., Cl. 138-120.000.

Kablaoui, Mahmoud S.: *See*—
Sung, Rodney L.; Zoleski, Benjamin H.; Cullen, William P.; and Kablaoui, Mahmoud S., 4,420,407., Cl. 252-33.400.

Kabushiki Kaisha Akashi Seisakusho: *See*—
Onoguchi, Akira; Miyazawa, Mitsuhisa; Yamazaki, Shigetomo; and Inoue, Masahiro, 4,420,686., Cl. 250-310.000.

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Furuta, Mitsuru; and Nakashimizu, Takeo, 4,420,051., Cl. 177-25.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Baba, Kiyokazu, 4,419,955., Cl. 118-227.000.
Sato, Yoshito; Chiba, Kazukiyo; and Matsumoto, Minoru, 4,420,058., Cl. 180-68.00P.

Kabushiki Kaisha Mitutoyo Seisakusho: *See*—
Miyamoto, Shigeo, 4,419,825., Cl. 33-169.00R.

Kabushiki Kaisha Suwa Seikosha: *See*—
Okada, Junichi, 4,420,764., Cl. 346-140.00R.

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Ando, Takayuki, 4,420,126., Cl. 242-107.200.
Kojima, Ikuzo, 4,420,172., Cl. 280-802.000.
Moriya, Shigeru; Yosida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Katsuno, Mitsuaki, 4,420,173., Cl. 280-804.000.

Kabushikikaisha Shibaura Denshi Seisakusho: *See*—
Kitamura, Kenzo; Miura, Tetsuo; Ookubo, Satoshi; and Nagata, Hideyuki, 4,419,888., Cl. 73-336.500.

Kaempfer, Knut: *See*—
Gettert, Hans; and Kaempfer, Knut, 4,420,342., Cl. 134-3.000.

Kaji, Hisatsugu; and Watanabe, Kazuhiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for producing spherical particles of carbon and of activated carbon. 4,420,443., Cl. 264-15.000.

Kajimoto, Norifumi; and Sasaki, Kinji, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,420,408., Cl. 256-62.540.

Kakimoto, Toshihiko, to Nissan Motor Co., Ltd. Engine mount arrangement. 4,420,060., Cl. 180-300.000.

Kalb, Frank H. Lunch bucket. 4,420,678., Cl. 219-387.000.

Kalinin, Anatoly N.: *See*—
Rubanov, Alexandr S.; Tanin, Leonid V.; Vasilieva, Ljudmila V.; Kalinin, Anatoly N.; Bursky, Vyacheslav A.; and Vidmant, Felix V., 4,420,218., Cl. 350-3.850.

Kallay, Maria: *See*—
Buhler, Ulrich; Kindler, Horst; Kuhlein, Klaus; Kallay, Maria; Kosubek, Uwe; Lowenfeld, Rudolf; and Roth, Kurt, 4,420,308., Cl. 8-464.000.

Kallmann, Jurgen, to Palitex Project-Company GmbH. Apparatus for the controlled feeding and taking-off of a thread into and out of a thread treatment section. 4,420,108., Cl. 226-34.000.

Kaltz, Milton C., to American Sunroof Corporation. Pivotal-sliding roof panel apparatus. 4,420,184., Cl. 296-221.000.

Kamachi, Shinichi: *See*—
Fujiwara, Toshihide; and Kamachi, Shinichi, 4,420,383., Cl. 204-180.00G.

Kaman Aerospace Corporation: *See*—
Flannelly, William G., 4,420,134., Cl. 248-559.000.

Kameoka, Yoshifumi: *See*—
Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dentaro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332., Cl. 75-26.000.

Kameyama, Kazuhide; and Kiyofuji, Takahiro, to Nippon Steel Corporation. Apparatus for blocking escape of heat in hot slabs manufactured on continuous casting machines. 4,420,029., Cl. 164-448.000.

Kameyama, Yoshio: *See*—
Yanai, Tadamasa; Sagehashi, Risaburo; Kameyama, Yoshio; and Shimomura, Takao, 4,420,162., Cl. 277-96.100.

Kamide, Noboru: *See*—
Hattori, Shuzo; Kamide, Noboru; Tokudome, Katsumi; Ishikawa, Michio; and Hayashi, Yuji, 4,420,835., Cl. 372-88.000.

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Takano, Yoshikazu; Kamimura, Tomohisa; and Fujikawa, Mitsunobu, 4,420,779., Cl. 360-92.000.

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Kanai, Kazuo: *See*—
Nakatani, Genji; Kanai, Kazuo; Itoh, Haruo; Takasaki, Yasuto; Ohkoshi, Kenji; and Yanagida, Yoshinobu, 4,420,304., Cl. 432-83.000.

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Ohtani, Tamio; and Kanaya, Yasuhiko, 4,420,685., Cl. 250-222.200.

Kanbe, Junichiro; and Fukuda, Tadaji, to Canon Kabushiki Kaisha. Member for electrophotography with a-Si and c-Si layers. 4,420,546., Cl. 430-57.000.

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Kanebo, Ltd.: *See*—
Matsui, Masao; Naito, Hiroshi; and Okamoto, Kazuo, 4,420,534., Cl. 428-372.000.

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Matsui, Masao; Naito, Hiroshi; and Okamoto, Kazuo, 4,420,534., Cl. 428-372.000.

Kaneko, Dentaro: *See*—
Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dentaro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332., Cl. 75-26.000.

Kaneko, Kimiyoshi: *See*—
Ohyama, Hiroshi; Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Takada, Sanae; Morita, Ken; Wada, Takuo; Miyahara, Masahiko; and Arakawa, Masazumi, 4,420,486., Cl. 424-272.000.

Kaneko, Yasuyuki; Itoh, Masao; and Takahashi, Shinji, to Nagoya University. Method of treating waste liquors containing phenol. 4,420,397., Cl. 210-611.000.

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Kania, Norbert: *See*—
Bohlmann, Volker; and Kania, Norbert, 4,420,063., Cl. 181-229.000.

Kanno, Toshiyuki: *See*—
Ueda, Kazuo; Horio, Yoshio; Kanno, Toshiyuki; and Abe, Yoshio, 4,420,501., Cl. 427-54.100.

Kanou, Fumio: *See*—
Kawaguchi, Kiyoshi; Yamada, Muneki; Kato, Nobuyuki; Kanou, Fumio; Sakamoto, Akira; and Mitsuhashi, Minoru, 4,420,454., Cl. 264-512.000.

Kapaan, Hendrikus J.; and Verburgh, Martin B., to SKF Industrial Trading & Development Company B.V. Device for producing an object consisting of at least two parts movable relative to one another one of which is substantially enclosed within the other. 4,419,816., Cl. 29-724.000.

Karlin, Richard A.: *See*—
Barlow, Gordon A.; Tutt, Timothy T.; Karlin, Richard A.; and Krutsch, John R., 4,420,261., Cl. 356-375.000.

Karol, James J.; and Young, Thornton J., to Bendix Corporation, The. Hermetic through bulkhead electrical connector. 4,420,210., Cl. 339-94.00M.

Karymov, Anatoly A.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701., Cl. 310-54.000.

Kasahara, Hiroshi, to Nisshin Kogyo Kabushiki Kaisha. Toggle assembly for vehicles or cars. 4,419,923., Cl. 91-460.000.

Kashio, Toshio, to Casio Computer Co., Ltd. Electronic musical instrument. 4,419,919., Cl. 84-1.270.

Kasten, Alan J., to Harris Corporation. Reversibly programmable polycrystalline silicon memory element. 4,420,766., Cl. 357-59.000.

Kastl, Alfons; Lehnert, Klaus; Koninger, Horst; and Schirk, Guter, to Agfa-Gevaert AG. Mounting assembly for film-squeezing rollers. 4,420,241., Cl. 354-319.000.

Kasuya, Atsumi: *See*—
Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; and Miyaji, Akira, 4,420,773., Cl. 358-335.000.

Katao, Hisashi, to Olympus Optical Company Limited. Electrophotographic copier having movable optical elements for changing the magnification of an original document. 4,420,245., Cl. 355-11.000.

Kathke, Gregor: *See*—
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860., Cl. 57-22.000.

Kato, Akifumi; Yoshida, Junichi; and Yamamoto, Ryoichi, to Mitsui Petrochemical Industries Ltd. Process for multi-step gaseous phase polymerization of olefins. 4,420,592., Cl. 526-65.000.

Kato, Nobuyuki: *See*—
Kawaguchi, Kiyoshi; Yamada, Muneki; Kato, Nobuyuki; Kanou, Fumio; Sakamoto, Akira; and Mitsuhashi, Minoru, 4,420,454., Cl. 264-512.000.

Kato, Tadaaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Collagen fibers for use in medical treatments. 4,420,339., Cl. 106-124.000.

Katsuma, Makoto; Mizogui, Toyokazu; Isobe, Takashi; Hiramatsu, Akira; Murakami, Hiroyasu; and Ishida, Toyoki, to Canon Kabushiki Kaisha. Tripartite camera with releasable coupling between each part. 4,420,240., Cl. 354-288.000.

Katsuno, Mitsuaki: *See*—
Moriya, Shigeru; Yosida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Katsuno, Mitsuaki, 4,420,173., Cl. 280-804.000.

Katsuta, Tetsuro: *See*—
Tachibana, Eiichi; and Katsuta, Tetsuro, 4,420,363., Cl. 156-627.000.

Kaufman, Marvin L., to Mobil Oil Corporation. Coating compositions having dual curing mechanisms. 4,420,605., Cl. 528-94.000.

Kaufmann, Meinolph, to BBC Brown, Boveri & Company Limited. Liquid crystal display cell, process for its production and cell plate. 4,420,224., Cl. 350-338.000.

Kaut, Albin. Plug-assembled sectional display rack. 4,419,938., Cl. 108-111.000.

Kawada, Kenji: *See*—
Shiga, Shoji; Suzuki, Akitoshi; Goma, Yasuo; and Kawada, Kenji, 4,420,377., Cl. 204-28.000.

Kawaguchi, Kiyoshi; Yamada, Muneki; Kato, Nobuyuki; Kanou, Fumio; Sakamoto, Akira; and Mitsuhashi, Minoru, to Toyo Seikan Kaisha, Limited. Method of making a plastic hollow article. 4,420,454., Cl. 264-512.000.

Kawanishi, Toshiyuki: *See*—
Tabata, Yukio; and Kawanishi, Toshiyuki, 4,420,758., Cl. 346-76.0PH.

Kawasaki Steel Corporation: *See*—
Yoshiei, Kato; Kyoji, Nakanishi; and Tsutomu, Nozaki, 4,420,334., Cl. 75-60.000.

Keeton, John H. Hot wire cutter for automatic sleeve making machine. 4,419,950., Cl. 112-290.000.

Kelsey-Hayes Co.: *See*—
Reikowski, Harold J., 4,419,908., Cl. 74-552.000.
Kendall Company, The: *See*—
Wilson, Earl D.; and Holmes, Martin J., 4,420,085., Cl. 206-571.000.
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Jurgen, Appenrodt, 4,420,748., Cl. 340-715.000.
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Fischer, Jochen; and Scholl, Hans, 4,419,946., Cl. 112-121.120.
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Funcik, Jack F.; and Kolanowski, Clarence, 4,419,817., Cl. 29-749.000.
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Itoh, Takashi, 4,420,680., Cl. 219-469.000.

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VanderVaart, Gerry, 4,420,034., Cl. 165-29.000.

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Matsumoto, Mitsuo; Yoshimura, Noriaki; and Tamura, Masuhiko, 4,420,640., Cl. 568-454.000.
Tanihara, Masao; Nakashima, Toshihide; and Takakura, Koichi, 4,420,395., Cl. 210-263.000.
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Grenci, Carl A., deceased; and Jordan, William C., executor, 4,419,884., Cl. 73-49.800.

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Loyer, Georges; Bonnet, Jean; and Lazzarini, Roger, 4,420,285., Cl. 414-291.000.

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Glantz, Jerome J., 4,420,494., Cl. 426-441.000.

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Gutierrez, Eddie N.; and Lamberti, Vincent, 4,420,621., Cl. 549-322.000.

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Hammond, Kenneth G.; Sendra, Joseph C.; Watts, Lewis W., Jr.; Marquis, Edward T.; and Larkin, John M., 4,420,647., Cl. 585-10.000.

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Dunlap, Thomas G.; Jameson, William G., Jr.; Mefford, Carl R.; Nelson, Harold L.; and Cearley, James E., 4,420,458., Cl. 376-447.000.
Melcher, Franz-Josef: *See*—
Grutzedick, Hartmut; Scheerer, Joachim; Knothe, Erich; and Melcher, Franz-Josef, 4,420,055., Cl. 177-212.000.
Merck & Co., Inc.: *See*—
Albers-Schonberg, George; Joshua, Henry; and Lopez, Maria B., 4,420,491., Cl. 424-311.000.
Bolhofer, William A.; Cragoe, Edward J.; and Hoffman, Jacob M., Jr, 4,420,615., Cl. 544-279.000.
Jones, James H., 4,420,480., Cl. 424-248.400.
Messerschmitt-Boelkow-Blohm GmbH: *See*—
Steinmetz, Guenter; Steenbeck, Ulf; and Reismayr, Dieter, 4,419,937., Cl. 104-281.000.
Messerschmitt-Bolkow-Blohm-Gesellschaft mit Beschrankter Haftung: *See*—
Stetter, Gunter, 4,420,129., Cl. 244-3.150.
Metal Era, Inc.: *See*—
Butzen, William J., 4,419,850., Cl. 52-60.000.
Metzger, William J., to Midland-Ross Corporation. Rotary railroad car coupler assembly with a horizontal key/slot arrangement. 4,420,088., Cl. 213-50.500.
Meyer-Ebrecht, Dietrich, to U.S. Philips Corporation. Circuit arrangement for the transmission of measurement value signals. 4,420,753., Cl. 340-870.260.
Meyer, Theodore O.; and Hickman, Thomas E., to Ford Aerospace & Communications Corporation. Lightweight metal-gas battery. 4,420,545., Cl. 429-101.000.
Miale, Joseph N.: *See*—
Chen, Nai Y.; and Miale, Joseph N., 4,420,561., Cl. 435-161.000.
Michelet, Guy: *See*—
Bret, Georges; and Michelet, Guy, 4,420,222., Cl. 350-295.000.
Middleton, Martin J., to Westland Aircraft Limited. Mooring devices. 4,420,131., Cl. 244-115.000.
Midland-Ross Corporation: *See*—
Metzger, William J., 4,420,088., Cl. 213-50.500.
Midorikawa, Akio: *See*—
Kuroda, Yoshimi; Ito, Shichinosuke; Midorikawa, Akio; and Terashima, Kuniomi, 4,420,601., Cl. 528-76.000.
Miki, Nobuaki; and Yokoyama, Shoji, to Aisin-Warner Kabushiki Kaisha. Shift control mechanism in an automatic transmission for vehicles. 4,419,910., Cl. 74-867.000.
Milani, Carlo; Carminati, Giovanni M.; and Sovera, Attilio, to Selvi & C. S.p.A. 1,4-Bis(acetylsalicyloyloxy)piperizine derivatives. 4,420,482., Cl. 424-250.000.
Miller, Edward H., to General Electric Company. Rotor stabilizing labyrinth seals for steam turbines. 4,420,161., Cl. 277-56.000.
Miller, Harold J.: *See*—
Johnson, Mize, Jr.; and Miller, Harold J., 4,420,806., Cl. 364-200.000.
Miller, Jack V. Circular gas discharge reflector lamp. 4,420,799., Cl. 362-216.000.
Miller, Mark H., to Federal Products Corporation. Head for bore gauge. 4,419,829., Cl. 33-178.00R.
Miller, Mark H., to Federal Products Corporation. Bore gauge head assembly. 4,419,830., Cl. 33-178.00R.
Milliken Research Corporation: *See*—
Marco, Francis W., 4,420,507., Cl. 427-170.000.
Mima, Hiroshi, to Murata Kikai Kabushiki Kaisha. Splicing apparatus for spun yarns. 4,419,859., Cl. 57-22.000.

Minakata, Matsuo: *See—*
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,419,869., Cl. 68-5.00D.

Minnesota Mining and Manufacturing Company: *See—*
Cadwell, Donald E., 4,420,549., Cl. 430-158.000.
Hackett, Brian K., 4,420,831., Cl. 370-50.000.
Petersen, Neil E., 4,419,993., Cl. 128-201.150.

Minolta Camera Kabushiki Kaisha: *See—*
Taniguchi, Nobuyuki; Hoda, Takeo; Oyokota, Shigeru; and Seigenji, Koyoshi, 4,420,236., Cl. 354-21.000.

Misaki, Hideo: *See—*
Ikuta, Shigeru; Matsuura, Kazuo; and Misaki, Hideo, 4,420,562., Cl. 435-227.000.

Mischenko, Nicholas, to Bell & Howell Company. Selectively positionable slide tray position sensing arrangement for slide projector apparatus. 4,420,232., Cl. 353-25.000.

Mita, Yukimitsu; Sano, Ken-ichi; Matsuhira, Shinya; and Nakajo, Tetsuo, to Showa Denko Kabushiki Kaisha. Rhodium catalyst and method for preparing the same. 4,420,420., Cl. 502-261.000.

Mitchell, Mark T. Stand for dirt bikes. 4,420,164., Cl. 280-293.000.

Mitchell, Michael I.: *See—*
Kirby, Ian J.; Mitchell, Michael I.; and Stratton, Andrew, 4,419,933., Cl. 102-206.000.

Mitsubishi Chemical Industries Ltd.: *See—*
Jikihara, Tetsuo; Oda, Masatsugu; Ushinohama, Kazuyuki; Watanabe, Hisao; and Suzuki, Seiichi, 4,420,327., Cl. 71-96.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Hisatsune, Fumiyuki; Yamagata, Shinji; Terachi, Junichi; and Yoshiyasu, Hajimu, 4,420,660., Cl. 200-144.00R.
Muto, Katsutoshi; Sawada, Takao; and Komine, Yoshiharu, 4,419,889., Cl. 73-336.500.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Hada, Michio; Shiraishi, Yoshihiro; Hino, Masao; and Seto, Toru, 4,420,313., Cl. 55-96.000.
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; Oshima, Michio; Okino, Susumu; and Shigeta, Sadaichi, 4,420,465., Cl. 423-242.000.

Mitsubishi Paper Mills, Ltd.: *See—*
Ohashi, Minoru; Futaki, Kiyoshi; and Iwaosa, Katsuaki, 4,420,554., Cl. 430-446.000.

Mitsuhashi, Minoru: *See—*
Kawaguchi, Kiyoshi; Yamada, Muneki; Kato, Nobuyuki; Kanou, Fumio; Sakamoto, Akira; and Mitsuhashi, Minoru, 4,420,454., Cl. 264-512.000.

Mitsui Engineering & Shipbuilding Co., Ltd.: *See—*
Yamamoto, Sueshi; Nagata, Kenichi; Tanimichi, Jisaku; and Takebe, Yoshiharu, 4,420,445., Cl. 264-40.400.

Mitsui Petrochemical Industries Ltd.: *See—*
Kato, Akifumi; Yoshida, Junichi; and Yamamoto, Ryoichi, 4,420,592., Cl. 526-65.000.

Mitsuitoatsu Chemicals Inc.: *See—*
Okazaki, Yutaka; Tokuda, Hiroshi; Miyahara, Shiyoichiro; and Yamada, Yoshitsugu, 4,420,481., Cl. 424-250.000.

Mitutoyo Mfg. Co., Ltd.: *See—*
Kanda, Yoshiro, 4,419,826., Cl. 33-172.00R.

Miura, Tetsuo: *See—*
Kitamura, Kenzo; Miura, Tetsuo; Ookubo, Satoshi; and Nagata, Hideyuki, 4,419,888., Cl. 73-336.500.

Mixner, Ingomar, to U.S. Philips Corporation. Resilient motor mounting for an electric dry shaver or the like. 4,420,702., Cl. 310-50.000.

Miyagi, Hideo: *See—*
Nagase, Masaomi; Ono, Hironobu; Nakano, Jiro; and Miyagi, Hideo, 4,419,974., Cl. 123-418.000.

Miyahara, Masahiko: *See—*
Ohyama, Hiroshi; Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Takada, Sanae; Morita, Ken; Wada, Takuo; Miyahara, Masahiko; and Arakawa, Masazumi, 4,420,486., Cl. 424-272.000.

Miyahara, Shiyoichiro: *See—*
Okazaki, Yutaka; Tokuda, Hiroshi; Miyahara, Shiyoichiro; and Yamada, Yoshitsugu, 4,420,481., Cl. 424-250.000.

Miyai, Masahiko: *See—*
Okouchi, Isao; Takahashi, Sankichi; Mukai, Yasuteru; Otake, Katsumoto; Sasaki, Takuya; and Miyai, Masahiko, 4,420,038., Cl. 165-95.000.

Miyaji, Akira: *See—*
Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; and Miyaji, Akira, 4,420,773., Cl. 358-335.000.

Miyamoto, Shigeo, to Kabushiki Kaisha Mitutoyo Seisakusho. Height gauge. 4,419,825., Cl. 33-169.00R.

Miyashita, Kiyoshi, to Olympus Optical Company Limited. Apparatus for peeling or separating a record paper from a photosensitive drum of an electrophotographic copying machine. 4,420,152., Cl. 271-309.000.

Miyazawa, Mitsuhisa: *See—*
Onoguchi, Akira; Miyazawa, Mitsuhisa; Yamazaki, Shigetomo; and Inoue, Masahiro, 4,420,686., Cl. 250-310.000.

Miyoshi, Tadahiko; Yamazaki, Takeo; and Maeda, Kunihiro, to Hitachi, Ltd. Potentially non-linear resistor and process for producing the same. 4,420,737., Cl. 338-21.000.

Mizogui, Toyokazu: *See—*
Katsuma, Makoto; Mizogui, Toyokazu; Isobe, Takashi; Hiramatsu, Akira; Murakami, Hiroyasu; and Ishida, Toyoki, 4,420,240., Cl. 354-288.000.

Mizuhara, Howard, to GTE Products Corporation. Method of making preforms for brazing and hardfacing. 4,420,459., Cl. 419-61.000.

Mizusawa Kagaku Kogyo Kabushiki Kaisha: *See—*
Ogawa, Masahide; Masuko, Tetsuo; Goto, Kunio; Sugai, Hideo; and Takahashi, Masao, 4,420,419., Cl. 252-455.00Z.

Mobay Chemical Corporation: *See—*
Rawlings, Herbert L.; and Reinert, Gerard E., 4,420,584., Cl. 524-502.000.

Mobil Oil Corporation: *See—*
Braid, Milton, 4,420,579., Cl. 524-328.000.
Chen, Nai Y.; and Miale, Joseph N., 4,420,561., Cl. 435-161.000.
Chu, Chin-Chiun, 4,420,418., Cl. 502-77.000.
Gournay, Luke S., 4,419,887., Cl. 73-152.000.
Hungerford, Gordon P., 4,420,514., Cl. 427-430.100.
Kaufman, Marvin L., 4,420,605., Cl. 528-94.000.
Krutchen, Charles M., 4,420,448., Cl. 264-53.000.
Schmitt, Kirk D., 4,420,565., Cl. 436-27.000.
Shu, Winston R., 4,420,008., Cl. 137-4.000.

Moeremans, Marc K. J. J.: *See—*
De Mey, Jan R.; and Moeremans, Marc K. J. J., 4,420,558., Cl. 435-7.000.

Moertel, George B., to Talon, Inc. Continuous filament slide fastener with cutaway heels. 4,419,793., Cl. 24-413.000.

Mohr, Bernard; Pappas, Nicholas J.; Chopra, Kuldip S.; and Salensky, George A., to Elkem Metals Company. Color retention pigment for paint compositions using latex vehicles. 4,420,340., Cl. 106-288.00B.

Molex Incorporated: *See—*
Funcik, Jack F.; and Kolanowski, Clarence, 4,419,817., Cl. 29-749.000.
Siebold, Donald J.; Troy, Michael K.; and Lenz, William R., 4,420,706., Cl. 310-324.000.

Molins Limited: *See—*
Thomas, Eric R., 4,420,074., Cl. 198-128.000.

Moncrief, Marion L., Jr.: *See—*
Hernandez, Rafael; Chow, Edmund E.; Moncrief, Marion L., Jr.; and Glass, Frank S., 4,420,810., Cl. 364-509.000.

Monitronik Ltee: *See—*
Taylor, Frank; and Maurer, Klemens, 4,419,838., Cl. 40-605.000.

Monsanto Company: *See—*
Vaidyanathan, Kumbakonam R., 4,420,645., Cl. 568-937.000.

Montedison S.p.A.: *See—*
Bertelli, Guido; and Locatelli, Renato, 4,420,577., Cl. 524-83.000.

Montgomery, Glenn E.: *See—*
Lee, Quarterman; Watson, Larry E.; and Montgomery, Glenn E., 4,420,003., Cl. 134-80.000.

Moore, Bernard S., to Pfizer Inc. 6-Alpha-halopenicillanic acid 1,1-dioxides. 4,420,426., Cl. 260-245.20R.

Moore, L. Frank; and Price, George M., to Frymaster Corporation, The. Spray cleaning system for frying apparatus. 4,420,006., Cl. 134-167.00R.

Morduchowitz, Abraham, to Texaco Inc. Secondary recovery process using brine soluble terpolymers. 4,420,598., Cl. 526-307.500.

Morello, Edwin F., to Standard Oil Company (Indiana). Polyamides from itaconic acid and diamines. 4,420,608., Cl. 528-324.000.

Morgan Construction Company: *See—*
Klusmier, Kenneth L., 4,419,928., Cl. 100-7.000.

Mori, Kei. Sun tracking apparatus. 4,419,981., Cl. 126-425.000.

Mori, Kei. Device for dispersing light rays issuing from a light guide. 4,420,796., Cl. 362-32.000.

Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dentaro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, to Research Association for Residual Oil Processing. Process for the production of reduced iron and thermal cracking of heavy oils. 4,420,332., Cl. 75-26.000.

Moriarity, Thomas C.; and Geiger, William J., to PPG Industries, Inc. Ungelled polyepoxide-polyoxyalkylenepolyamine resins, aqueous dispersions thereof, and their use in cationic electrodeposition. 4,420,574., Cl. 523-404.000.

Morimitsu, Tsuneo: *See—*
Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dentaro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332., Cl. 75-26.000.

Morin, Jury E.: *See—*
Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701., Cl. 310-54.000.

Morishita, Hiroshi: *See—*
Ishii, Hiroshi; Seki, Kohji; Morishita, Hiroshi; and Yamazaki, Toshiaki, 4,419,882., Cl. 73-40.700.

Morita, Ken: *See—*
Ohyama, Hiroshi; Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Takada, Sanae; Morita, Ken; Wada, Takuo; Miyahara, Masahiko; and Arakawa, Masazumi, 4,420,486., Cl. 424-272.000.

Moritz, Werner, to Kabelschlepp Gesellschaft mit beschrankter Haftung. Energy conduit support. 4,420,017., Cl. 138-120.000.

Moriya, Shigeru; Yosida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Katsuno, Mitsuaki, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Automatic seatbelt system. 4,420,173., Cl. 280-804.000.

Morris, John C.; and Jackson, Winston J., Jr., to Eastman Kodak Company. Polyesters of trans-4,4-stilbenedicarboxylic acid, terephthalic acid or 2,6-naphthalenedicarboxylic acid, and 1,2-propanediol. 4,420,607., Cl. 528-298.000.

Morrison, Ward D.: *See—*
Hibbard, George A.; Morrison, Ward D.; and Lumbra, Ralph C., 4,420,277., Cl. 405-260.000.

Mortenson, Carl N.: *See*—
Law, Don C.; Mortenson, Carl N.; Ripple, Paul; and Eckhardt, Roger S., 4,420,166., Cl. 280-5.240.

Morwick, Tina M.; Paget, Charles J.; and Wikel, James H., to Eli Lilly and Company. Olefinic benzimidazoles, formulations, and antiviral methods. 4,420,479., Cl. 424-246.000.

Mosby, Brian J.: *See*—
Bardsley, Harold B.; Mosby, Brian J.; Barlow, John M.; and Walton, Brian, 4,420,124., Cl. 242-66.000.

Mosby, James F.: *See*—
Bertolacini, Ralph J.; Mosby, James F.; and Schwartz, John G., 4,420,388., Cl. 208-112.000.

Moser, Erwin: *See*—
Efinger, Arnold; and Moser, Erwin, 4,420,661., Cl. 200-144.00B.

Moser, Gottfried; Nau, Walter; and Neumann, Ernst D., to Klockner-Humboldt-Deutz AG. Liquid heating system. 4,420,114., Cl. 237-1.00R.

Motorola Inc.: *See*—
Fay, Gary V.; and Pshaenich, Alvin, 4,420,700., Cl. 307-571.000.
Tomey, John J., 4,420,786., Cl. 361-77.000.

Motoyama, Kazuyasu; Nakao, Toshihiro; Nasu, Mitsuo; and Tomizawa, Yoshio, to Olympus Optical Company Limited. Connecting device. 4,420,216., Cl. 339-183.000.

Motsenbocker, Gregg A. Portable liquid dispenser with carrying case. 4,420,097., Cl. 222-131.000.

Moulin, Georges. Tool change device. 4,419,807., Cl. 29-568.000.

Mowry, William H., Jr., to Burroughs Corporation. Color copy resistant document using irregular outline letters in a multi-void background. 4,420,175., Cl. 283-93.000.

MPL Inc.: *See*—
Finkelstein, Sam D., 4,420,092., Cl. 220-254.000.

MTU Motoren- und Turbinen-Union GmbH: *See*—
Bischoff, Hans, 4,420,288., Cl. 416-244.00A.

Mu, Jacob J.: *See*—
Park, Won C.; and Mu, Jacob J., 4,420,466., Cl. 423-304.000.

Muchel, Franz, to Carl-Zeiss-Stiftung. Optical waveguide connector using aspheric lenses. 4,420,219., Cl. 350-96.180.

Mueller, John J., to Containaire, Inc. Dispensing apparatus. 4,420,100., Cl. 222-205.000.

Muench, Frank J., Jr., to RTE Corporation. Low current clearing back up fuse. 4,420,735., Cl. 337-244.000.

Mukai, Yasuteru: *See*—
Okouchi, Isao; Takahashi, Sankichi; Mukai, Yasuteru; Otake, Katsumoto; Sasaki, Takuya; and Miyai, Masahiko, 4,420,038., Cl. 165-95.000.

Muller, Manfred: *See*—
Forberg, Horst; Radelow, Wolfgang; Achtnig, Klaus-Peter; and Muller, Manfred, 4,420,200., Cl. 339-13.000.

Muller, Siegfried. Cable sleeve sealing assembly. 4,420,654., Cl. 174-92.000.

Muller, Wolfgang H. E.; and Hofmann, Peter, to Chemische Werke Huls A.G. Production of alkyl esters of saturated aliphatic carboxylic acids. 4,420,429., Cl. 260-410.90R.

Mummert, Thomas A., to Jobst Institute, Inc. Electronic circuit for a dynamic pressure wave pneumatic control system. 4,419,988., Cl. 128-24.00R.

Munhofen, Cody: *See*—
Hanson, Harold W., Jr.; and Munhofen, Cody, 4,420,496., Cl. 426-609.000.

Munro. James A.; and Vansteelant, Marc G., to Sperry Corporation. Knotters. 4,420,177., Cl. 289-14.000.

Munz, Erich. Support plate. 4,420,135., Cl. 248-633.000.

Murakami, Hiroyasu: *See*—
Katsuma, Makoto; Mizogui, Toyokazu; Isobe, Takashi; Hiramatsu, Akira; Murakami, Hiroyasu; and Ishida, Toyoki, 4,420,240., Cl. 354-288.000.

Murata Kikai Kabushiki Kaisha: *See*—
Fujiwara, Michiaki; and Uramoto, Makoto, 4,419,861., Cl. 57-261.000.
Mima, Hiroshi, 4,419,859., Cl. 57-22.000.

Murata Manufacturing Co., Ltd.: *See*—
Nakamura, Teruo; and Arai, Naoto, 4,420,538., Cl. 428-411.000.

Murata, Masayoshi: *See*—
Takaya, Takao; Inoue, Yoshikazu; Yasuda, Nobuyoshi; and Murata, Masayoshi, 4,420,477., Cl. 424-246.000.

Murata, Toshio, to Citizen Watch Co., Ltd. Structure for preventing the rotating of a register ring of a diver's watch. 4,420,264., Cl. 368-223.000.

Muratsubaki, Yoshiharu: *See*—
Takahashi, Atsushi; Muratsubaki, Yoshiharu; and Ishizaka, Hiroyuki, 4,420,333., Cl. 75-55.000.

Murib, Jawad H., to National Distillers and Chemical Corporation. Preparation of 2-pyrrolidones. 4,420,620., Cl. 548-554.000.

Muto, Katsutoshi; Sawada, Takao; and Komine, Yoshiharu, to Mitsubishi Denki Kabushiki Kaisha. Moisture sensitive device. 4,419,889., Cl. 73-336.500.

Muto, Masaaki: *See*—
Fukuda, Sunichi; and Muto, Masaaki, 4,420,653., Cl. 174-72.00B.

N. V. Bekaert S.A.: *See*—
Wieme, Andre, 4,420,523., Cl. 428-109.000.

Nagase, Masaomi; Ono, Hironobu; Nakano, Jiro; and Miyagi, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of and apparatus for controlling the ignition timing of an internal combustion engine. 4,419,974., Cl. 123-418.000.

Nagashima, Michiyoshi: *See*—
Yoshida, Tomio; Nagashima, Michiyoshi; Harigae, Shunji; Ichinose, Makoto; and Wakami, Noboru, 4,420,828., Cl. 369-47.000.

Nagashima, Nao: *See*—
Suzuki, Koji; Nakahira, Joji; Kuroda, Koki; Nagashima, Nao; and Takayanagi, Yoshiaki, 4,420,247., Cl. 355-14.00C.

Nagata, Hideyuki: *See*—
Kitamura, Kenzo; Miura, Tetsuo; Ookubo, Satoshi; and Nagata, Hideyuki, 4,419,888., Cl. 73-336.500.

Nagata, Kenichi: *See*—
Yamamoto, Sueshi; Nagata, Kenichi; Tanimichi, Jisaku; and Takebe, Yoshiharu, 4,420,445., Cl. 264-40.400.

Nagatani, Kuniaki: *See*—
Yokomichi, Isao; Haga, Takahiro; Nasu, Rikuo; Nagatani, Kuniaki; and Nakajima, Toshio, 4,420,618., Cl. 546-345.000.

Nagoya University: *See*—
Kaneko, Yasuyuki; Itoh, Masao; and Takahashi, Shinji, 4,420,397., Cl. 210-611.000.

Naito, Hiroshi: *See*—
Matsui, Masao; Naito, Hiroshi; and Okamoto, Kazuo, 4,420,534., Cl. 428-372.000.

Naito, Yoshikazu: *See*—
Shimizu, Toshiharu; Okuyama, Nobutaka; Naito, Yoshikazu; and Matsumoto, Syuzo, 4,420,734., Cl. 335-213.000.

Naka, Tessyu: *See*—
Ito, Yoshimasa; Hashizume, Junji; Ikeda, Junichi; Utsumi, Noriyuki; and Naka, Tessyu, 4,420,812., Cl. 364-513.000.

Nakabu, Shigeo: *See*—
Nukii, Takashi; Nakabu, Shigeo; Iwasaki, Masaru; and Awane, Katsunobu, 4,420,364., Cl. 156-631.000.

Nakagawa, Masatoshi: *See*—
Hirose, Masahiko; Yasui, Tsuyoshi; Ochi, Yoshiharu; and Nakagawa, Masatoshi, 4,420,498., Cl. 427-39.000.

Nakagawa, Tsutomu: *See*—
Aiba, Seiichi; Hiratani, Kazuhisa; and Nakagawa, Tsutomu, 4,420,612., Cl. 536-102.000.

Nakahira, Joji: *See*—
Suzuki, Koji; Nakahira, Joji; Kuroda, Koki; Nagashima, Nao; and Takayanagi, Yoshiaki, 4,420,247., Cl. 355-14.00C.

Nakahora, Toru: *See*—
Kondo, Katsumi; Fuwa, Yoshio; Harayama, Akira; and Nakahora, Toru, 4,420,543., Cl. 428-564.000.

Nakajima, Toshio: *See*—
Yokomichi, Isao; Haga, Takahiro; Nasu, Rikuo; Nagatani, Kuniaki; and Nakajima, Toshio, 4,420,618., Cl. 546-345.000.

Nakajo, Tetsuo: *See*—
Mita, Yukimitsu; Sano, Ken-ichi; Matsuhira, Shinya; and Nakajo, Tetsuo, 4,420,420., Cl. 502-261.000.

Nakamura, Keijiroh: *See*—
Tsuji, Nobuhiko; Nakamura, Keijiroh; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, 4,420,564., Cl. 435-288.000.

Nakamura, Kenji. Re-sealable dispenser-container. 4,420,080., Cl. 206-449.000.

Nakamura, Kiyoshi; Nishida, Katsutoshi; Ochiai, Toshihiko; Ando, Akio; and Okada, Syoji, to Tokyo Shibaura Denki Kabushiki Kaisha. Cylinder liner for an internal combustion engine. 4,419,971., Cl. 123-193.00C.

Nakamura, Teruo; and Arai, Naoto, to Murata Manufacturing Co., Ltd. Heat-sensitive recording materials. 4,420,538., Cl. 428-411.000.

Nakano, Jiro: *See*—
Nagase, Masaomi; Ono, Hironobu; Nakano, Jiro; and Miyagi, Hideo, 4,419,974., Cl. 123-418.000.

Nakano, Masao: *See*—
Imazeki, Kazuyoshi; and Nakano, Masao, 4,420,716., Cl. 318-379.000.

Nakano, Taizoh: *See*—
Tadauchi, Masaharu; Tanno, Kiyohiko; and Nakano, Taizoh, 4,420,742., Cl. 340-347.0AD.

Nakao, Hiroaki: *See*—
Suezawa, Takahiko; Koizumi, Satoru; Nakao, Hiroaki; and Tsuchitani, Takashi, 4,420,783., Cl. 360-137.000.

Nakao, Toshihiro: *See*—
Motoyama, Kazuyasu; Nakao, Toshihiro; Nasu, Mitsuo; and Tomizawa, Yoshio, 4,420,216., Cl. 339-183.000.

Nakashima, Akira, to Tokai Chemical Industries, Ltd. Process for producing foam moldings with an insert. 4,420,447., Cl. 264-46.400.

Nakashima, Toshihide: *See*—
Tanihara, Masao; Nakashima, Toshihide; and Takakura, Koichi, 4,420,395., Cl. 210-263.000.

Nakashimizu, Takeo: *See*—
Furutz, Mitsuru; and Nakashimizu, Takeo, 4,420,051., Cl. 177-25.000.

Nakatani, Genji; Kanai, Kazuo; Itoh, Haruo; Takasaki, Yasuto; Ohkoshi, Kenji; and Yanagida, Yoshinobu, to Nippon Kokan Kabushiki Kaisha. Apparatus for manufacturing rapidly cooled solidified slag. 4,420,304., Cl. 432-83.000.

Nakatani, Mitsuo; Yamazaki, Mitsuo; Okunaka, Masaaki; Sudo, Ryoichi; Tochigi, Kenji; and Yokono, Hitoshi, to Hitachi, Ltd.; and Hitachi Chemical Co., Ltd. Composition and process for preparing transparent conducting film. 4,420,500., Cl. 427-54.100.

Nakauchi, Kenji, to Fuji Photo Film Co., Ltd. Light measuring device for controlling exposure. 4,420,252., Cl. 356-225.000.

Naku, Virgil: *See*—
Pizzurro, Joseph C.; and Naku, Virgil, 4,420,099., Cl. 222-205.000.

Nalco Chemical Company: *See*—
Bhattacharyya, Bhupati R.; and Ballweber, Edward G., 4,420,586., Cl. 524-769.000.
Pocius, Frances C.; and Buchanan, William T., 4,420,463., Cl. 422-266.000.

Narita, Kiichi: *See*—
Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dentaro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332., Cl. 75-26.000.

Nashua Control Instruments, Inc.: *See*—
Trump, Dennis H., 4,420,249., Cl. 355-84.000.

Nasu, Mitsuo: *See*—
Motoyama, Kazuyasu; Nakao, Toshihiro; Nasu, Mitsuo; and Tomizawa, Yoshio, 4,420,216., Cl. 339-183.000.

Nasu, Norio: *See*—
Yamaguchi, Nobutaka; Fujiyama, Masaaki; and Nasu, Norio, 4,420,532., Cl. 428-329.000.

Nasu, Rikuo: *See*—
Yokomichi, Isao; Haga, Takahiro; Nasu, Rikuo; Nagatani, Kuniaki; and Nakajima, Toshio, 4,420,618., Cl. 546-345.000.

National Distillers and Chemical Corporation: *See*—
Murib, Jawad H., 4,420,620., Cl. 548-554.000.

National Research Development Corp.: *See*—
Singer, Alfred R. E., 4,420,441., Cl. 264-7.000.

National Semiconductor Corporation: *See*—
Fisher, Amnon, 4,420,695., Cl. 307-242.000.
Seyffert, Michael; and d'Entremont, Alan F., 4,420,107., Cl. 226-32.000.

Nau, Walter: *See*—
Moser, Gottfried; Nau, Walter; and Neumann, Ernst D., 4,420,114., Cl. 237-1.00R.

Nauchno-Issledovatelsky Sektor Vsesojuznogo Proektno-Izyskatelskogo I Nauchno-Issledovatelskogo Instituta "Gidroproekt" Imeni S.Ya. Zhuka: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701., Cl. 310-54.000.

Navarro, Ramon V.: *See*—
Protacio, Alfredo C.; Navarro, Ramon V.; Rio, Eliseo M., Jr.; Alonte, Antonio D.; and Pascual, Felix J., 4,419,967., Cl. 123-1.00A.

NCR Corporation: *See*—
Paganini, Bruno J.; and Hale, William J., 4,420,751., Cl. 340-825.330.
Topich, James A., 4,419,812., Cl. 29-571.000.

Neat Products, Inc.: *See*—
Greck, Edward T.; and Neat Products, Inc., 4,420,493., Cl. 426-420.000.

Negoro, Ikuo: *See*—
Ogawa, Ryota; Negoro, Ikuo; Iwanade, Hisao; and Arai, Yasunori, 4,420,248., Cl. 355-57.000.

Nelb, Robert G., II; and Oertel, Richard W., III, to Upjohn Company, The. Continuous, solvent-free process for preparing thermoplastic polyamides and polyesteramides. 4,420,603., Cl. 528-80.000.

Nelb, Robert G., II: *See*—
Bonk, Henry W.; Nelb, Robert G., II; and Oertel, Richard W., III, 4,420,602., Cl. 528-80.000.

Nelissen, Johann W. A.; Ponnee, Johannes J.; Legierse, Petrus E. J.; and Van Ruler, Johannes, to U.S. Philips Corporation. Method of manufacturing an article of a synthetic resin which has a metal layer. 4,420,506., Cl. 427-162.000.

Nelson, Darrel S.: *See*—
Lee, Michael C. H.; and Nelson, Darrel S., 4,420,585., Cl. 524-548.000.

Nelson, Edward M., to Outboard Marine Corporation. Lubrication system for a die casting machine. 4,420,028., Cl. 164-149.000.

Nelson, Harold L.: *See*—
Dunlap, Thomas G.; Jameson, William G., Jr.; Mefford, Carl R.; Nelson, Harold L.; and Cearley, James E., 4,420,458., Cl. 376-447.000.

Nemeni, Tibor M.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701., Cl. 310-54.000.

Nepper, John P. Flexible hinge and closure member for a luggage carrier. 4,420,105., Cl. 224-328.000.

Neubauer, Harry; Greten, Berndt; and Seeger, Gunter, to Bison-Werke Bahre & Greten GmbH & Co. KG. Apparatus and method for the manufacture of particleboard. 4,420,357., Cl. 156-274.600.

Neumann, Ernst D.: *See*—
Moser, Gottfried; Nau, Walter; and Neumann, Ernst D., 4,420,114., Cl. 237-1.00R.

Newton, William A.; and Graham, Marshall D., to Coulter Electronics, Inc. Field focused particle sensing zone. 4,420,720., Cl. 324-71.400.

Neyret, Guy, to Sodex Magister, Societe d'Exploitation des Brevets. Neiman. Bi-stable mechanism and anti-theft device for a motor vehicle comprising such mechanism. 4,420,659., Cl. 200-67.00A.

Nichols, Ralph A. Kink-preventing spine for aquarium air hoses. 4,420,016., Cl. 138-103.000.

Nickel, Walter; Schoening, Josef; and Schwiers, Hans-Georg, to Hochtemperatur-Reaktorbau GmbH. Mounting of power conductor and instrument lead penetrations for nuclear reactor installations. 4,420,456., Cl. 376-245.000.

Niedecker, Herbert. Filling tube for filling tubular casings with pasty material. 4,419,790., Cl. 17-35.000.

Niemeyer, Lutz; and Ragaller, Klaus, to BBC Brown, Boveri & Company Ltd. Compressed-gas circuit breaker. 4,420,662., Cl. 200-148.00R.

Nieuwhof, Arjen: *See*—
van't Sant, Jan P.; and Nieuwhof, Arjen, 4,420,331., Cl. 75-6.000.

Nifco Inc.: *See*—
Yamamoto, Kiyokazu; Hiratsuka, Ko; Tanaka, Toshie; and Iwasaki, Shigeyuki, 4,420,396., Cl. 210-416.400.

Nihonsanso Kabushiki Kaisha: *See*—
Ishii, Hiroshi; Seki, Kohji; Morishita, Hiroshi; and Yamazaki, Toshiaki, 4,419,882., Cl. 73-40.700.

Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., to Nauchno-Issledovatelsky Sektor Vsesojuznogo Proektno-Izyskatelskogo I Nauchno-Issledovatelskogo Instituta "Gidroproekt" Imeni S.Ya. Zhuka. Coupling unit for connection of generator high-voltage winding and inlet bar. 4,420,701., Cl. 310-54.000.

Nikolsky, Alexandr I.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701., Cl. 310-54.000.

Nippert, Charles R., Jr.: *See*—
Bergman, Roger M.; Bielecki, Edwin J.; and Nippert, Charles R., Jr., 4,420,469., Cl. 423-592.000.

Nippon Air Brake Co., Ltd.: *See*—
Arikawa, Tetsuro; and Inoue, Teruo, 4,420,191., Cl. 303-103.000.
Arikawa, Tetsuro; Inoue, Teruo; and Takiue, Yukihiro, 4,420,814., Cl. 364-565.000.

Nippon Carbide Kogyo Kabushiki Kaisha: *See*—
Takahashi, Atsushi; Muratsubaki, Yoshiharu; and Ishizaka, Hiroyuki, 4,420,333., Cl. 75-55.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Aoki, Eiichiro, 4,419,916., Cl. 84-1.010.
Ohe, Ichiro, 4,419,920., Cl. 84-115.000.
Suzuki, Takuya, 4,420,655., Cl. 381-94.000.

Nippon Kogaku K.K.: *See*—
Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; and Miyaji, Akira, 4,420,773., Cl. 358-335.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Nakatani, Genji; Kanai, Kazuo; Itoh, Haruo; Takasaki, Yasuto; Ohkoshi, Kenji; and Yanagida, Yoshinobu, 4,420,304., Cl. 432-83.000.

Nippon Light Metal Company Limited: *See*—
Ito, Tadao; and Hashimoto, Akio, 4,420,345., Cl. 148-3.000.

Nippon Seiko Kabushiki Kaisha: *See*—
Matsuoka, Katsutoshi, 4,419,897., Cl. 73-660.000.

Nippon Soken, Inc.: *See*—
Hattori, Tadashi; Yoshida, Hitoshi; Akutagawa, Keichi; Takata, Akira; and Fukuda, Tamotsu, 4,419,972., Cl. 123-337.000.

Nippon Steel Corporation: *See*—
Kameyama, Kazuhide; and Kiyofuji, Takahiro, 4,420,029., Cl. 164-448.000.
Ueda, Masanori; Sumitomo, Hidehiko; and Yoshimura, Hirofumi, 4,420,347., Cl. 148-12.00E.

Nippon Telegraph & Telephone Public Corporation: *See*—
Tadauchi, Masaharu; Tanno, Kiyohiko; and Nakano, Taizoh, 4,420,742., Cl. 340-347.0AD.

Nippon Victor Kabushiki Kaisha: *See*—
Yamazaki, Shigeru; Arai, Takao; Kobayashi, Masaharu; Hoshino, Takashi; Hibino, Chitoshi; and Kobari, Harukuni, 4,420,775., Cl. 360-38.100.

Nishida, Katsutoshi: *See*—
Nakamura, Kiyoshi; Nishida, Katsutoshi; Ochiai, Toshihiko; Ando, Akio; and Okada, Syoji, 4,419,971., Cl. 123-193.00C.

Nishikawa, Kinichi, to Yamaichi Electric Mfg. Co., Ltd. Socket having means of no-load engaging with and releasing from electronic unit. 4,420,207., Cl. 339-75.00M.

Nishikawa, Masaji, to Olympus Optical Company Ltd. Photosensitive member for electrophotography having ultraviolet absorption layer. 4,420,547., Cl. 430-57.000.

Nishimura, Koji, to Vital Kogyo Kabushiki Kaisha. Manual hoisting and pulling apparatus. 4,420,144., Cl. 254-345.000.

Nishina, Mitsuo, to Maruzen Sewing Machine Co., Ltd. Embroidering apparatus for use with sewing machines. 4,419,945., Cl. 112-103.000.

Nishino, Hisao, to Tohoku Metal Industries, Ltd. Switching regulator with base charge removal circuit. 4,420,804., Cl. 363-21.000.

Nissan Motor Co., Ltd.: *See*—
Fukushima, Masao, 4,420,062., Cl. 181-204.000.
Hosaka, Akio, 4,419,976., Cl. 123-458.000.
Kakimoto, Toshihiko, 4,420,060., Cl. 180-300.000.
Kubota, Masaharu; Kudo, Ichiro; and Ohgami, Masaaki, 4,419,975., Cl. 123-440.000.
Matsui, Tatsuhiko; Okada, Yasumasa; and Shimatsu, Minoru, 4,419,789., Cl. 16-308.000.
Omote, Kazuaki; and Hayashida, Masayoshi, 4,420,057., Cl. 180-54.00A.
Suzuki, Kunihiko, 4,420,059., Cl. 180-248.000.
Tohata, Toru, 4,420,797., Cl. 362-80.000.

Nisshin Kogyo Kabushiki Kaisha: *See*—
Kasahara, Hiroshi, 4,419,923., Cl. 91-460.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Otsuka, Saburo; Yoshikawa, Toshiyuki; Tokuda, Shoichi; and Ito, Yuuseke, 4,420,470., Cl. 424-28.000.
NL Industries, Inc.: *See*—
House, Roy F.; and Hoover, Lonnie D., 4,420,406., Cl. 252-8.55R.
Noirel, Yves M., to Etablissement Public de Diffusion dit "Telediffusion de France" ; and L'Etat Francais, representa par le Secretaire d'Etat aux Postes et Telecommunications et a la Telediffusion. Unidirectional data transmission system. 4,420,833., Cl. 370-83.000.
Nolt, James R., Jr., to Allis-Chalmers Corporation. Method and apparatus to produce electroslag T-joints where fillets are required. 4,420,672., Cl. 219-73.100.
Nolta, Arthur H.; and Reed, David G., to International Business Machines Corporation. Selectively holding data in a buffer for defective backing store tracks. 4,420,807., Cl. 364-200.000.
Nomoto, Mineo; Iwashita, Katsuhiro; Otsubo, Toru; and Aiuchi, Susumu, to Hitachi, Ltd. Projecting apparatus. 4,420,233., Cl. 353-122.000.
Nonaka, Mitsuhiro; and Kobayashi, Yuichi, to Ricoh Company, Ltd. Multiple reproduction apparatus. 4,420,246., Cl. 355-14.00R.
Norland Corporation: *See*—
Belt, Kenneth W.; and Mattson, John S., 4,420,078., Cl. 206-305.000.
Norsk Hydro A/S: *See*—
Strand, Olaf; Omdal, Bjarne; and Svendsen, Jens, 4,420,021., Cl. 141-10.000.
Novak, Albert P. Device for the automatic editing, at the receiver, of unwanted program material from broadcast electrical signals. 4,420,769., Cl. 358-139.000.
Novotechnik KG Offterdinger GmbH & Co., Firma: *See*—
Blessing, Fritz; Margitics, Gabor; and Brauer, Gerhard, 4,420,273., Cl. 403-24.000.
Nukii, Takashi; Nakabu, Shigeo; Iwasaki, Masaru; and Awane, Katsunobu, to Sharp Kabushiki Kaisha. High-insulation multi-layer device formed on a metal substrate. 4,420,364., Cl. 156-631.000.
Oak Industries Inc.: *See*—
Jesson, Joseph E., 4,420,744., Cl. 340-365.00E.
Larson, Willis A.; and Dulen, Edwina K., 4,420,663., Cl. 200-159.00B.
Oakes, Billy D.; Dupart, Michael S.; and Cringle, David C., to Dow Chemical Company, The. Bismuth inhibitors for acid gas conditioning solutions. 4,420,337., Cl. 106-14.150.
Oakland Corporation, The: *See*—
Wallace, Richard B., 4,420,604., Cl. 528-93.000.
Oba, Yoichi: *See*—
Yamada, Hiromichi; Suzuki, Atsushi; Oba, Yoichi; Uchida, Yoko; Kohno, Hideki; Fukino, Tadashi; and Yoshida, Minoru, 4,420,444., Cl. 264-21.000.
Oberhans, Johann, to Dr. Johannes Heidenhain GmbH. Digital electrical length measuring instrument. 4,419,824., Cl. 33-143.00L.
OBO Bettermann OHG: *See*—
Jordan, Ernst G., 4,420,674., Cl. 219-99.000.
Occidental Research Corporation: *See*—
Park, Won C.; and Mu, Jacob J., 4,420,466., Cl. 423-304.000.
Ochi, Yoshiharu: *See*—
Hirose, Masahiko; Yasui, Tsuyoshi; Ochi, Yoshiharu; and Nakagawa, Masatoshi, 4,420,498., Cl. 427-39.000.
Ochiai, Toshihiko: *See*—
Nakamura, Kiyoshi; Nishida, Katsutoshi; Ochiai, Toshihiko; Ando, Akio; and Okada, Syoji, 4,419,971., Cl. 123-193.00C.
Oda, Masatsugu: *See*—
Jikihara, Tetsuo; Oda, Masatsugu; Ushinohama, Kazuyuki; Watanabe, Hisao; and Suzuki, Seiichi, 4,420,327., Cl. 71-96.000.
Odenwalder, Heinrich; and Marx, Paul, to Agfa-Gevaert Aktiengesellschaft. Color photographic recording material containing a non-diffusible electron donor precursor compound. 4,420,557., Cl. 430-559.000.
Odessky Ordena Tradovogo Kraskogo: *See*—
Belikov, Viktor T.; Iviev, Anatoly D.; Sitnichenko, Valentin M.; Shvets, Vladimir I.; and Bushtian, Leonid V., 4,420,712., Cl. 318-41.000.
Oertel, Richard W., III: *See*—
Bonk, Henry W.; Nelb, Robert G., II; and Oertel, Richard W., III, 4,420,602., Cl. 528-80.000.
Nelb, Robert G., II; and Oertel, Richard W., III, 4,420,603., Cl. 528-80.000.
Ogawa, Hiroshi; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,420,540., Cl. 428-457.000.
Ogawa, Hiroyasu; and Shima, Mikio, to Toho Belson Co., Ltd. Emulsion type sizing agent for carbon fibers, process for its preparation, and method for using same. 4,420,512., Cl. 427-386.000.
Ogawa, Masahide; Masuko, Tetsuo; Goto, Kunio; Sugai, Hideo; and Takahashi, Masao, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Abrasion-resistant granular zeolite and process for preparation thereof. 4,420,419., Cl. 252-455.00Z.
Ogawa, Ryota; Negoro, Ikuo; Iwanade, Hisao; and Arai, Yasunori, to Asahi Kogaku Kogyo Kabushiki Kaisha. Variable magnification copying device. 4,420,248., Cl. 355-57.000.
Ogawa, Toshihisa: *See*—
Amano, Takehiro; Ogawa, Toshihisa; Yoshikawa, Kensei; Shiobara, Yoshinori; Sano, Tatsuhiko; Ohuchi, Yutaka; Tanami, Tohru; Ito, Shoichi; and Sawada, Jiro, 4,420,631., Cl. 560-104.000.
Ogawa, Yukio; Harigaya, Isao; Yamada, Tateo; and Hirohata, Michio, to Canon Kabushiki Kaisha. Exposure control system. 4,420,237., Cl. 354-458.000.
Ogiu, Hisao, to Olympus Optical Co., Ltd. Laser endoscope. 4,419,987., Cl. 128-4.000.
Ohashi, Minoru; Futaki, Kiyoshi; and Iwaosa, Katsuaki, to Mitsubishi Paper Mills, Ltd. Silver halide photosensitive materials. 4,420,554., Cl. 430-446.000.
Ohba, Yozo: *See*—
Toyoda, Takashi; Ohba, Yozo; Yamanaka, Masaaki; and Shirai, Kanji, 4,420,530., Cl. 428-323.000.
Ohe, Ichi.o, to Nippon Gakki Seizo Kabushiki Kaisha. Apparatus for recording and reproducing musical performance. 4,419,920., Cl. 84-115.000.
Ohgami, Masaaki: *See*—
Kubota, Masaharu; Kudo, Ichiro; and Ohgami, Masaaki, 4,419,975., Cl. 123-440.000.
Ohkoshi, Kenji: *See*—
Nakatani, Genji; Kanai, Kazuo; Itoh, Haruo; Takasaki, Yasuto; Ohkoshi, Kenji; and Yanagida, Yoshinobu, 4,420,304., Cl. 432-83.000.
Ohta, Keiichi: *See*—
Tsukamura, Yoshibiro; Aizawa, Hidekusi; and Ohta, Keiichi, 4,420,268., Cl. 400-233.000.
Ohtani, Tamio; and Kanaya, Yasuhiko, to Hitachi Seiko, Ltd. Method and equipment for detecting tool failure. 4,420,685., Cl. 250-222.200.
Ohtsuki, Osamu: *See*—
Chibata, Ichiro; Sumi, Akihiko; Ito, Hiroshi; Ohtsuki, Osamu; and Izutsu, Nozomu, 4,420,432., Cl. 260-501.110.
Ohuchi, Yutaka: *See*—
Amano, Takehiro; Ogawa, Toshihisa; Yoshikawa, Kensei; Shiobara, Yoshinori; Sano, Tatsuhiko; Ohuchi, Yutaka; Tanami, Tohru; Ito, Shoichi; and Sawada, Jiro, 4,420,631., Cl. 560-104.000.
Ohyama, Hiroshi; Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Takada, Sanae; Morita, Ken; Wada, Takuo; Miyahara, Masahiko; and Arakawa, Masazumi, to Hokko Chemical Industry Co., Ltd. Benzoxazolone derivatives, processes for preparation thereof and compositions containing them. 4,420,486., Cl. 424-272.000.
Oji Yuka Goseishi Kabushiki Kaisha: *See*—
Toyoda, Takashi; Ohba, Yozo; Yamanaka, Masaaki; and Shirai, Kanji, 4,420,530., Cl. 428-323.000.
Oka, Koichiro; Tanaka, Hiroshi; and Harigae, Makoto, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing shadow mask. 4,420,366., Cl. 156-644.000.
Okabayashi, Naonori, to Sharp Kabushiki Kaisha. Alphanumeric visual display of the matrix type. 4,420,750., Cl. 340-791.000.
Okada, Junichi, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Ink jet printer head. 4,420,764., Cl. 346-140.00R.
Okada, Shingo; Sawa, Yuji; and Adachi, Kuniomi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Automatic continuous vacuum packaging method and apparatus. 4,419,854., Cl. 53-434.000.
Okada, Syoji: *See*—
Nakamura, Kiyoshi; Nishida, Katsutoshi; Ochiai, Toshihiko; Ando, Akio; and Okada, Syoji, 4,419,971., Cl. 123-193.00C.
Okada, Yasumasa: *See*—
Matsui, Tatsuhiko; Okada, Yasumasa; and Shimatsu, Minoru, 4,419,789., Cl. 16-308.000.
Okamoto, Kazuo: *See*—
Matsui, Masao; Naito, Hiroshi; and Okamoto, Kazuo, 4,420,534., Cl. 428-372.000.
Okamura, Akio; Tanaka, Shuji; and Sakamoto, Tamotsu, to Fuji Xerox Co., Ltd. Developing agent density controlling device. 4,419,960., Cl. 118-712.000.
Okamura, Masatoshi; and Shiba, Haruo, to TDK Electronics Co., Ltd. Magnetic tape cassette. 4,420,128., Cl. 242-199.000.
Okazaki, Yutaka; Tokuda, Hiroshi; Miyahara, Shiyoichiro; and Yamada, Yoshitsugu, to Mitsuitoatsu Chemicals Inc. Use of piperazine compounds as immunopotentiating agents. 4,420,481., Cl. 424-250.000.
Okino, Susumu: *See*—
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; Oshima, Michio; Okino, Susumu; and Shigeta, Sadaichi, 4,420,465., Cl. 423-242.000.
Okiyama, Toshiaki, to Fuji Photo Film Co., Ltd. Transfer film for electrophotographic copier. 4,420,528., Cl. 428-220.000.
Okouchi, Isao; Takahashi, Sankichi; Mukai, Yasuteru; Otake, Katsumoto; Sasaki, Takuya; and Miyai, Masahiko, to Hitachi, Ltd. Cleaning system for heat conductive conduits of a heat exchanger. 4,420,038., Cl. 165-95.000.
Okunaka, Masaaki: *See*—
Nakatani, Mitsuo; Yamazaki, Mitsuo; Okunaka, Masaaki; Sudo, Ryoichi; Tochigi, Kenji; and Yokono, Hitoshi, 4,420,500., Cl. 427-54.100.
Okuyama, Nobutaka: *See*—
Shimizu, Toshiharu; Okuyama, Nobutaka; Naito, Yoshikazu; and Matsumoto, Syuzo, 4,420,734., Cl. 335-213.000.
Olapinski, Hans: *See*—
Dworak, Ulf; Jud, Hans; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,420,142., Cl. 251-368.000.
Olin Corp.: *See*—
Cline, Warren K., 4,420,002., Cl. 131-334.000.
Pryor, Michael J.; and Tyler, Derek E., 4,420,030., Cl. 164-472.000.
Olson, Carl O., Jr. Force or vibration indicating device utilizing microwave resonance ferramic gyrators. 4,419,896., Cl. 73-652.000.

Olympus Optical Co., Ltd.: *See—*
Fujiwara, Toshihide; and Kamachi, Shinichi, 4,420,383., Cl. 204-180.00G.
Fujiwara, Toshihide, 4,420,384., Cl. 204-180.00G.
Furuta, Kenji, 4,420,777., Cl. 360-61.000.
Katao, Hisashi, 4,420,245., Cl. 355-11.000.
Miyashita, Kiyoshi, 4,420,152., Cl. 271-309.000.
Motoyama, Kazuyasu; Nakao, Toshihiro; Nasu, Mitsuo; and Tomizawa, Yoshio, 4,420,216., Cl. 339-183.000.
Nishikawa, Masaji, 4,420,547., Cl. 430-57.000.
Ogiu, Hisao, 4,419,987., Cl. 128-4.000.
Sakurai, Yoshifumi, 4,420,781., Cl. 360-112.000.
Terada, Katumi, 4,420,235., Cl. 354-266.000.

Omdal, Bjarne: *See—*
Strand, Olaf; Omdal, Bjarne; and Svendsen, Jens, 4,420,021., Cl. 141-10.000.

Omote, Kazuaki; and Hayashida, Masayoshi, to Nissan Motor Company, Limited. Air induction structure for an automobile air cleaner. 4,420,057., Cl. 180-54.00A.

O'Neill, Richard K., to Diamond International Corp. Squeeze bottle with self-venting dispensing closure. 4,420,101., Cl. 222-212.000.

Ono, Hironobu: *See—*
Nagase, Masaomi; Ono, Hironobu; Nakano, Jiro; and Miyagi, Hideo, 4,419,974., Cl. 123-418.000.

Ono, Masaaki: *See—*
Wakatsuki, Noboru; Kojima, Yuji; and Ono, Masaaki, 4,420,730., Cl. 333-195.000.

Onoguchi, Akira; Miyazawa, Mitsuhisa; Yamazaki, Shigetomo; and Inoue, Masahiro, to Kabushiki Kaisha Akashi Seisakusho. Scanning electron microscope or similar equipment capable of displaying simultaneously a plurality of images of specimen. 4,420,686., Cl. 250-310.000.

Ookubo, Satoshi: *See—*
Kitamura, Kenzo; Miura, Tetsuo; Ookubo, Satoshi; and Nagata, Hideyuki, 4,419,888., Cl. 73-336.500.

Opalka, Chester J., Jr.: *See—*
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,420,617., Cl. 546-257.000.

Opitz, Konrad; Grossmann, Max; Kruse, Hurbert; Schneider, Manfred; and Uhrig, Heinz, to Hoechst Aktiengesellschaft. Use of oxyalkylated novolaks as preparation agents for disperse dyestuffs and preparations made with said agents. 4,420,310., Cl. 8-560.000.

Opperud, Hans-Jorgen; Carlsson, Sven A. L.; and Ericson, Hans G., to Volvo BM AB. Method of controlling a power transmission device and control system for carrying out said method. 4,419,909., Cl. 74-856.000.

Orlowski, Jan A.; Wagner, Helmar; and Butler, David V., to Blendax-Werke R. Schneider GmbH & Co. Tetraacrylic and tetramethacrylic esters and dental materials containing same. 4,420,306., Cl. 433-228.000.

O'Rourke, Thomas W.: *See—*
Ingalls, William E.; and O'Rourke, Thomas W., 4,420,272., Cl. 403-4.000.

Ortega, Francis, to U.S. Philips Corporation. Screen-printing ink. 4,420,338., Cl. 106-20.000.

Ortho Diagnostic Systems Inc.: *See—*
Reckel, Rudolph P.; and Harris, Joanne L., 4,420,461., Cl. 422-61.000.

Oshima, Michio: *See—*
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; Oshima, Michio; Okino, Susumu; and Shigeta, Sadaichi, 4,420,465., Cl. 423-24∠.000.

Otake, Katsumoto: *See—*
Okouchi, Isao; Takahashi, Sankichi; Mukai, Yasuteru; Otake, Katsumoto; Sasaki, Takuya; and Miyai, Masahiko, 4,420,038., Cl. 165-95.000.

Otis Engineering Corporation: *See—*
Patel, Dhirajlal C., 4,420,041., Cl. 166-278.000.
Pullin, William H.; and Long, Olen R., 4,420,044., Cl. 166-322.000.
Tunstall, Karl N., 4,420,042., Cl. 166-297.000.

Otomo, Shigekazu: *See—*
Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; and Abe, Mitsuo, 4,420,348., Cl. 148-403.000.

Otsubo, Toru: *See—*
Nomoto, Mineo; Iwashita, Katsuhiro; Otsubo, Toru; and Aiuchi, Susumu, 4,420,233., Cl. 353-122.000.

Otsuka, Saburo; Yoshikawa, Toshiyuki; Tokuda, Shoichi; and Ito, Yuuseke, to Nitto Electric Industrial Co., Ltd.; and Toa Eiyo Ltd. Percutaneous absorption type pharmaceutical preparation of isosorbide dinitrate or pentaerythritol tetranitrate in pressure-sensitive laminate. 4,420,470., Cl. 424-28.000.

Otto Bihler Maschinenfabrik GmbH & Co. K.G.: *See—*
Bihler, Otto; and Augenstein, Reiner, 4,419,800., Cl. 29-148.40C.

Oussani, James J., to Staplex Company, Inc., The. Envelope opener device. 4,419,915., Cl. 83-887.000.

Outboard Marine Corporation: *See—*
Nelson, Edward M., 4,420,028., Cl. 164-149.000.
Smith, LaVerne D., 4,419,857., Cl. 56-11.300.

Owen, Brian, to Bell Telephone Laboratories, Incorporated. FET Amplifier with wide dynamic range. 4,420,724., Cl. 330-277.000.

Owens-Corning Fiberglas Corporation: *See—*
Dunn, Charles S.; and Seng, Stephen, 4,420,838., Cl. 373-92.000.
Gorgati, Romolo, 4,420,524., Cl. 428-110.000.

OY Kaukus AB: *See—*
Hamunen, Antti, 4,420,427., Cl. 260-397.250.

Oyokota, Shigeru: *See—*
Taniguchi, Nobuyuki; Hoda, Takeo; Oyokota, Shigeru; and Seigenji, Koyoshi, 4,420,236., Cl. 354-21.000.

Pacala, Luba A.: *See—*
Blickensderfer, John R.; and Pacala, Luba A., 4,420,571., Cl. 523-149.000.

Paganini, Bruno J.; and Hale, William J., to NCR Corporation. Detection method and apparatus for a user device or automatic teller bank machine. 4,420,751., Cl. 340-825.330.

Page, Donald F.: *See—*
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,420,617., Cl. 546-257.000.

Paget, Charles J.: *See—*
Morwick, Tina M.; Paget, Charles J.; and Wikel, James H., 4,420,479., Cl. 424-246.000.

Palandri, Fabio V., to AMF Incorporated. Miniaturized electromagnetic relay. 4,420,733., Cl. 335-202.000.

Palitex Project-Company GmbH: *See—*
Kallmann, Jurgen, 4,420,108., Cl. 226-34.000.

Paloian, Michael. Hydroponic planter. 4,419,842., Cl. 47-62.000.

Panavision, Incorporated: *See—*
Gottschalk, Robert E., 4,420,231., Cl. 352-142.000.

Pao, Mary A.: *See—*
Klar, Erhard; and Pao, Mary A., 4,420,336., Cl. 75-246.000.

Pappas, Nicholas J.: *See—*
Mohr, Bernard; Pappas, Nicholas J.; Chopra, Kuldip S.; and Salensky, George A., 4,420,340., Cl. 106-288.00B.

Par Way Manufacturing Co.: *See—*
Hanson, Harold W., Jr.; and Munhofen, Cody, 4,420,496., Cl. 426-609.000.

Park-Ohio Industries, Inc.: *See—*
Lewis, John C., 4,420,667., Cl. 219-10.410.

Park, Won C.; and Mu, Jacob J., to Occidental Research Corporation. Process for producing phosphorus pentoxide. 4,420,466., Cl. 423-304.000.

Parker, Harold P.: *See—*
Parker, Paraque, 4,419,777., Cl. 5-108.000.

Parker, Paraque, to Parker, Harold P. Baby bed rocking mechanism. 4,419,777., Cl. 5-108.000.

Parkhurst, Hugh J., Jr.: *See—*
Huibers, Derk T. A.; and Parkhurst, Hugh J., Jr., 4,420,644., Cl. 568-806.000.

Parks, David M. Thin decorative cementitious veneers and a method for making same. 4,420,525., Cl. 428-156.000.

Partington, Everett J. Heating system. 4,420,677., Cl. 219-341.000.

Pascual, Felix J.: *See—*
Protacio, Alfredo C.; Navarro, Ramon V.; Rio, Eliseo M., Jr.; Alonte, Antonio D.; and Pascual, Felix J., 4,419,967., Cl. 123-1.00A.

Passons, William E.; Card, Joseph L.; and Card, Roy T. Multiple stroke looper mechanism for stitching machine. 4,419,944., Cl. 112-79.00R.

Patel, Dhirajlal C., to Otis Engineering Corporation. Method of using a valve in gravel packing. 4,420,041., Cl. 166-278.000.

Patrick, John P.: *See—*
Kos, Joseph M.; Patrick, John P.; and Harner, Kermit I., 4,420,692., Cl. 290-44.000.

Paulson, Roger A.: *See—*
Dickhudt, Eugene A.; and Paulson, Roger A., 4,419,819., Cl. 29-857.000.

Payette, Lionel J.: *See—*
Saunders, Hollis S.; and Payette, Lionel J., 4,420,536., Cl. 428-383.000.

Peck, Richard M.; Reif, Robert B.; and Albrechtson, Loren R., to Peck, Richard M. Method of producing printed images with a color facsimile printing device. 4,420,552., Cl. 430-252.000.

Pemco Corporation: *See—*
Atakkaan, Namik O., 4,420,202., Cl. 339-14.00R.

Penaz, Vaclav: *See—*
Spacek, Jindrich; Smrcek, Vaclav; Voda, Karel; Kosek, Jiri; Hrdina, Jan; and Penaz, Vaclav, 4,419,876., Cl. 72-57.000.

Pepsico, Inc.: *See—*
Campau, Daniel N., 4,420,156., Cl. 273-77.00A.

Permatek, Inc.: *See—*
Axelrod, Herbert R., 4,420,282., Cl. 412-4.000.

Peroutka, Fritz; Thumm, Helmut; Bahr, Theodor; and Stricker, Walter, to J. M. Voith GmbH. Waste paper disintegrating, sorting and fiber recovery apparatus. 4,420,117., Cl. 241-46.170.

Peter, Oskar; and Stahr, Anton. Brake assembly for fluid operated piston and cylinder device. 4,419,924., Cl. 92-27.000.

Petersen, Christian C.; and Westgate, Bernard C., Jr., to Polaroid Corporation. Apparatus for continuously incrementing an output member. 4,420,714., Cl. 318-135.000.

Petersen, Neil E., to Minnesota Mining & Manufacturing Company. Anti-fogging surgical mask. 4,419,993., Cl. 128-201.150.

Peterson, Leslie D., to Cooper Industries, Inc. Rate of penetration sensor for oil drilling rigs. 4,419,886., Cl. 73-151.500.

Peterson, Willard E., to Deere & Company. Disk gang assembly. 4,420,048., Cl. 172-568.000.

Petrolite Corporation: *See—*
Redmore, Derek, 4,420,399., Cl. 210-700.000.

Pettersson, Thorulf: *See—*
Fladda, Gerdt; and Pettersson, Thorulf, 4,420,256., Cl. 356-336.000.

Peveler, Richard D.: *See—*
Epstein, Peter F.; Peveler, Richard D.; and Fisch, Michael H., 4,420,437., Cl. 260-969.000.

Pfisterer, Hermann: *See—*
Bienert, Horst; and Pfisterer, Hermann, 4,420,185., Cl. 296-223.000.
Pfizer Inc.: *See—*
Moore, Bernard S., 4,420,426., Cl. 260-245.20R.
Phares, Hershel L.: *See—*
Valimont, James L.; and Phares, Hershel L., 4,420,362., Cl. 156-563.000.
Phelps, Barry C.; and Hall, John S., to California Interface and Software Limited Partnership. Identification card bearing latent image perceptible in the presence of background light. 4,420,174., Cl. 283-75.000.
Philip Morris Inc.: *See—*
Washington, James M.; Fillenwarth, Dale R.; and Utsch, Francis V., 4,420,635., Cl. 562-555.000.
Philipp, Adolf; Jirkovsky, Ivo; and Martel, Rene, to Averst McKenna & Harrison, Inc. Benzofuro[3,2-c]pyrazol-3-amine derivatives. 4,420,476., Cl. 424-232.000.
Phillips, Edwin R., to Sperry Corporation. Printer beam position feedback sensor. 4,420,760., Cl. 346-108.000.
Phillips Petroleum Company: *See—*
Beckworth, Alden E.; Howell, Jerald A.; and Tabler, Donald C., 4,420,389., Cl. 208-251.00R.
Cobb, Raymond L., 4,420,431., Cl. 260-465.900.
Lee, Roy C., 4,419,968., Cl. 123-3.000.
Wilson, Joseph F., 4,420,321., Cl. 71-43.000.
Pickering, Alan H., to English Electric Valve Company Limited. Co-axial magnetrons. 4,420,710., Cl. 315-39.770.
Pierce, Gordon F., to Canadian General Electric Company Limited. Frequency determining apparatus. 4,420,809., Cl. 364-484.000.
Pierrat, Frank A.: *See—*
Davis, Larry; and Pierrat, Frank A., 4,420,485., Cl. 424-267.000.
Pierson, Darrell E.: *See—*
Kunkel, Arden L.; and Pierson, Darrell E., 4,420,510., Cl. 427-208.200.
Piezo Electric Products, Inc.: *See—*
Kolm, Henry H.; and Kolm, Eric A., 4,420,266., Cl. 400-124.000.
Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See—*
Sotome, Tatuo; and Yokoi, Fumio, 4,419,912., Cl. 82-5.000.
Pioneer Electronic Corporation: *See—*
Sueyoshi, Susumu; and Ishikawa, Kikuo, 4,420,725., Cl. 330-288.000.
Pirsch, Peter, to Bell Telephone Laboratories, Incorporated. Technique for encoding multi-level signals. 4,420,771., Cl. 358-261.000.
Pitcher, Wayne H., Jr.: *See—*
Frost, Rodney I.; and Pitcher, Wayne H., Jr., 4,420,316., Cl. 55-523.000.
Pizzurro, Joseph C.; and Naku, Virgil, to Precision Valve Corporation. Cup-shaped actuator for aerosol dispenser. 4,420,099., Cl. 222-205.000.
Plasti-Kote Company, Inc.: *See—*
Rapaport, Stanley; and Cachat, Francis J., 4,420,575., Cl. 523-504.000.
Plath, Peter: *See—*
Eicken, Karl; Plath, Peter; and Wuerzer, Bruno, 4,420,324., Cl. 71-92.000.
Plifka, John W. Locking device for skiers use. 4,419,872., Cl. 70-18.000.
Pocius, Frances C.; and Buchanan, William T., to Nalco Chemical Company. Dry chemical feed system. 4,420,463., Cl. 422-266.000.
Polaroid Corporation: *See—*
McCaskill, Emmett S., 4,420,551., Cl. 430-234.000.
Petersen, Christian C.; and Westgate, Bernard C., Jr., 4,420,714., Cl. 318-135.000.
Widiger, Gary N., 4,420,627., Cl. 549-394.000.
Ponnee, Johannes J.: *See—*
Nelissen, Johann W. A.; Ponnee, Johannes J.; Legierse, Petrus E. J.; and Van Ruler, Johannes, 4,420,506., Cl. 427-162.000.
Pope, Benjamin D. Modular model structure. 4,419,840., Cl. 46-19.000.
Popp, Karl F.: *See—*
Gorman, William G.; and Popp, Karl F., 4,420,484., Cl. 424-326.000.
Post, Willem P., to Thomassen & Drijver-Verblifa N.V. Method of forming an outwardly inverted peripheral edge on a preformed metal lid. 4,420,283., Cl. 413-8.000.
Potekhin, Konstantin F.: *See—*
Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701., Cl. 310-54.000.
PPG Industries, Inc.: *See—*
Hyatt, Charles J., 4,420,106., Cl. 225-2.000.
Moriarity, Thomas C.; and Geiger, William J., 4,420,574., Cl. 523-404.000.
Valimont, James L.; and Shadle, Barry L., 4,420,361., Cl. 156-556.000.
Valimont, James L.; and Phares, Hershel L., 4,420,362., Cl. 156-563.000.
PQ Corporation: *See—*
Sands, Bruce W., 4,420,442., Cl. 264-13.000.
Precision Valve Corporation: *See—*
Pizzurro, Joseph C.; and Naku, Virgil, 4,420,099., Cl. 222-205.000.
Preedy, David R., to Signetics Corporation. Programmable read-only memory. 4,420,820., Cl. 365-105.000.
Preiser, Herman S.; Ticker, Arthur; and Hatley, Kenneth J. Method and apparatus for coating submerged portions of floating structures. 4,420,533., Cl. 428-351.000.
Preisler, James M.: *See—*
Stabel, Alwin J.; and Preisler, James M., 4,420,803., Cl. 362-369.000.
Preuhs, Hans-Jurgen: *See—*
Rohner, Joachim; Zumfeld, Heinz; Mauries, Reinhard; and Preuhs, Hans-Jurgen, 4,419,858., Cl. 57-22.000.
Price, Edison A.: *See—*
Smester, Paul R.; and Price, Edison A., 4,420,802., Cl. 362-364.000.
Price, George M.: *See—*
Moore, L. Frank; and Price, George M., 4,420,006., Cl. 134-167.00R.
Price-Pfister Brass Mfg. Co.: *See—*
Tarnay, Matthew G.; and LaBelle, John T., 4,420,811., Cl. 364-510.000.
Price, Robert J.; and Taber, Bruce E., to Data Card Corporation. System for processing and storing transaction data and for transmitting the transaction data to a remote host computer. 4,420,819., Cl. 364-900.000.
Priesnitz, Uwe: *See—*
Hoffmann, Hellmut; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,420,435., Cl. 260-940.000.
Primbs, Robert J., Jr., to United States of America, Air Force. Telemetry load link assembly. 4,420,755., Cl. 340-870.380.
Process Displays Company: *See—*
Bernie, Jack, 4,420,082., Cl. 206-526.000.
Process Technologies, Inc.: *See—*
Hernandez, Rafael; Chow, Edmund E.; Moncrief, Marion L., Jr.; and Glass, Frank S., 4,420,810., Cl. 364-509.000.
Procter & Gamble Company, The: *See—*
Laughlin, Robert G., 4,420,329., Cl. 71-122.000.
Wong, Louis F., 4,420,412., Cl. 252-186.380.
Proctor & Schwartz: *See—*
Scott, John F., 4,419,834., Cl. 34-57.00A.
Progar, Donald J., to United States of America, National Aeronautics and Space Administration. Hot melt recharge system. 4,420,518., Cl. 428-40.000.
Progressive Blasting Systems, Inc.: *See—*
DeClark, Bruce W.; and Weber, Joseph H., 4,419,875., Cl. 72-53.000.
Protacio, Alfredo C.; Navarro, Ramon V.; Rio, Eliseo M., Jr.; Alonte, Antonio D.; and Pascual, Felix J., to Protacio, Alfredo C. Method and apparatus for utilizing ethanol of any purity as a fuel in 4-stroke internal combustion engines. 4,419,967., Cl. 123-1.00A.
Prout, Addison S., to Bommer Industries, Inc. Adjustable spring hinge. 4,419,788., Cl. 16-300.000.
Pryor, Michael J.; and Tyler, Derek E., to Olin Corporation. Continuous lubrication casting molds. 4,420,030., Cl. 164-472.000.
Pryor, Timothy R., to Diffracto Ltd. Method and apparatus for detecting wear or breakage of tools and other objects. 4,420,253., Cl. 356-237.000.
Pshaenich, Alvin: *See—*
Fay, Gary V.; and Pshaenich, Alvin, 4,420,700., Cl. 307-571.000.
Pullin, William H.; and Long, Olen R., to Otis Engineering Corporation. Flow control system. 4,420,044., Cl. 166-322.000.
Purdue Frederick Company, The: *See—*
Shetty, Bola V.; and McFadden, Arthur, 4,420,487., Cl. 424-273.00B.
Purdue Research Foundation: *See—*
Whistler, Roy L., 4,420,489., Cl. 424-275.000.
Pust, Harold W.: *See—*
Martinez, Mark S.; and Pust, Harold W., 4,420,687., Cl. 250-343.000.
Putz, John M.: *See—*
Reiling, Gilbert H.; Putz, John M.; and Van Horn, David D., 4,420,801., Cl. 362-297.000.
Quaas, Gerwolf: *See—*
Uhrhan, Paul; Krauthausen, Edmund; Stahlke, Kurt-Rainer; Quaas, Gerwolf; and Ruetz, Lothar, 4,420,613., Cl. 544-51.000.
Quack, Erich: *See—*
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohmer, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860., Cl. 57-22.000.
Quantel S.A.: *See—*
Bret, Georges; and Michelet, Guy, 4,420,222., Cl. 350-295.000.
Quick, William H.: *See—*
James, Kenneth A.; Quick, William H.; August, Rudolf R.; and Strahan, Virgil H., 4,420,251., Cl. 356-32.000.
Qurnell, Frank D.; and Skarshaug, Nordahl H., to General Electric Company. End plug gauging device and method. 4,420,455., Cl. 376-245.000.
Raadsen, Johannes F. A., to U.S. Philips Corporation. Peak detector. 4,420,698., Cl. 307-351.000.
Rabinovich, Efim M.: *See—*
Belkin, German S.; Voskresensky, Stal N.; Kiselev, Viktor Y.; Lukatskaya, Ida A.; Rodionov, Valery V.; Skurikhin, Mikhail N.; Frolova, Irina B.; Zuev, Vyacheslav S.; Kornevv, Lev I.; Chervonenkis, Rauza A.; Rabinovich, Efim M.; Volkova, Tatyana P.; and Goryaev, German A., 4,420,346., Cl. 148-4.000.
Racal Safety Limited: *See—*
Hilton, Joseph R., 4,419,994., Cl. 128-206.190.
Radelow, Wolfgang: *See—*
Forberg, Horst; Radelow, Wolfgang; Achtnig, Klaus-Peter; and Muller, Manfred, 4,420,200., Cl. 339-13.000.

Rademaker, Onno: *See*—
Van Koppen, Christianus W. J.; Rademaker, Onno; and De Ron, Adriaan J., 4,420,032., Cl. 165-1.000.

Ragaller, Klaus: *See*—
Niemeyer, Lutz; and Ragaller, Klaus, 4,420,662., Cl. 200-148.00R.

Rahman, Atlaf, to Thomson-CSF Broadcast, Inc. Video background generation system. 4,420,770., Cl. 358-183.000.

Raidel, John E. Heavy vehicle suspension assembly with free floating springs and axle stabilizing torque rod. 4,420,171., Cl. 280-682.000.

Rakaczky, John A.: *See*—
Coates, Arthur D.; Donovan, William F.; Rakaczky, John A.; and Scott, Wayman E., 4,419,936., Cl. 102-364.000.

Rambaldini, Gianfranco: *See*—
Ducati, Umberto, 4,420,380., Cl. 204-66.000.

Ramsey, Frederick J.: *See*—
Shawcross, Alfred L.; Ramsey, Frederick J.; and Raymond, Arnold A., 4,420,121., Cl. 242-181.000.

Ramsey, John T.; and Ramsey, William J. Weightlifting apparatus. 4,420,154., Cl. 272-118.000.

Ramsey, William J.: *See*—
Ramsey, John T.; and Ramsey, William J., 4,420,154., Cl. 272-118.000.

Randall, Cyril A.: *See*—
Becker, Bernard B.; Bowman, John K.; and Randall, Cyril A., 4,420,010., Cl. 137-116.000.

Randolph, James B.: *See*—
Aug, Conrad J.; Guenther, Charles J.; and Randolph, James B., 4,420,203., Cl. 339-17.0CF.

Rapaport, Stanley; and Cachat, Francis J., to Plasti-Kote Company, Inc. Water reducible aerosol paints. 4,420,575., Cl. 523-504.000.

Rashleigh, Scott C.: *See*—
Burns, William K.; and Rashleigh, Scott C., 4,420,258., Cl. 356-350.000.

Rasmussen, Ole-Bendt. Method for film extrusion comprising rotary die parts. 4,420,451., Cl. 264-173.000.

Rathier, Gilbert J. M.: *See*—
Salle, Jacques E.; Jossif, Jean A. M.; Rathier, Gilbert J. M.; and Vales, Jean-Pierre, 4,420,832., Cl. 370-56.000.

Rattray, Kendrick D., to GTE Products Corporation. Fluorescent lamp employing means for controlling emission of short wavelength ultraviolet radiation. 4,420,709., Cl. 313-486.000.

Rau, William G., to Burroughs Corporation. Self oscillating acoustic displacement detector. 4,420,727., Cl. 331-65.000.

Rautenberg, Klaus: *See*—
Becker, Rolf; Bertrams, Josef- Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860., Cl. 57-22.000.

Rawlings, Herbert L.; and Reinert, Gerard E., to Mobay Chemical Corporation. Glass-filled polycarbonate of improved impact strength. 4,420,584., Cl. 524-502.000.

Raymond, Arnold A.: *See*—
Shawcross, Alfred L.; Ramsey, Frederick J.; and Raymond, Arnold A., 4,420,121., Cl. 242-181.000.

Raymond, Gary E. Cassette, for sheet photographic materials. 4,420,120., Cl. 242-71.700.

Raytheon Company: *See*—
Cooper, Kersi F.; and Drake, Jerry W., 4,420,504., Cl. 427-90.000.

RCA Corporation: *See*—
Dischert, William A., 4,419,848., Cl. 51-229.000.
Leung, Chung W.; Dawson, Robert H.; Blumenfeld, Martin A.; and Biondi, Dennis P., 4,420,503., Cl. 427-85.000.
Limberg, Allen L., 4,420,726., Cl. 330-288.000.
Tarng, Ming L., 4,420,765., Cl. 357-54.000.
Todd, Albert A., 4,420,722., Cl. 324-158.00R.
Upadhyayula, Lakshminarasimha C., 4,420,743., Cl. 340-347.0AD.

Reactor Services International, Inc.: *See*—
Easley, Othel D., Jr., 4,420,279., Cl. 406-14.000.

Reckel, Rudolph P.; and Harris, Joanne L., to Ortho Diagnostic Systems Inc. Agglutination-inhibition test kit for detecting immune complexes. 4,420,461., Cl. 422-61.000.

Recortec, Inc.: *See*—
Lee, Lester H.; and Wussow, George, 4,420,818., Cl. 364-900.000.

Redmore, Derek, to Petrolite Corporation. Quaternary aminomethyl phosphonates as scale inhibitors. 4,420,399., Cl. 210-700.000.

Reed, David G.: *See*—
Nolta, Arthur H.; and Reed, David G., 4,420,807., Cl. 364-200.000.

Reed, Frank J.: *See*—
Winkler, Theodore; and Reed, Frank J., 4,420,153., Cl. 271-304.000.

Reed Rock Bit Company: *See*—
Jones, Kenneth W., 4,420,050., Cl. 175-374.000.

Regie Nationale Des Usines Renault: *See*—
Gluza, Roland, 4,419,827., Cl. 33-174.00L.

Regipa, Robert, to Centre National d'Etudes Spatiales. Fabrication process for an envelope, in particular for space balloons, envelope thus made, and its application to the aerospace domain. 4,420,130., Cl. 244-31.000.

Rehmann, Wolfgang; and Sauer, Rudolf, to Robert Bosch GmbH. Temperature sensor. 4,420,738., Cl. 338-28.000.

Reiche, Horst: *See*—
Schimitzek, Gunter; and Reiche, Horst, 4,419,846., Cl. 51-55.000.

Reif, Robert B.: *See*—
Peck, Richard M.; Reif, Robert B.; and Albrechtson, Loren R., 4,420,552., Cl. 430-252.000.

Reikowski, Harold J., to Kelsey-Hayes Co. Mold and method of making spoked wheels and product of same. 4,419,908., Cl. 74-552.000.

Reiling, Gilbert H.; Putz, John M.; and Van Horn, David D., to General Electric Company. Reflector lamp. 4,420,801., Cl. 362-297.000.

Reilly Tar & Chemical Corp.: *See*—
Sowers, Edward E., 4,420,542., Cl. 428-541.000.

Reimold, Gunther: *See*—
Treffinger, Karl; and Reimold, Gunther, 4,420,072., Cl. 192-139.000.

Reinert, Gerard E.: *See*—
Rawlings, Herbert L.; and Reinert, Gerard E., 4,420,584., Cl. 524-502.000.

Reis, Edmund; and Wondra, Arthur, to Siemens Aktiengesellschaft. Plug contact. 4,420,209., Cl. 339-91.00R.

Reismayr, Dieter: *See*—
Steinmetz, Guenter; Steenbeck, Ulf; and Reismayr, Dieter, 4,419,937., Cl. 104-281.000.

Reist, Walter, to Ferag AG. Apparatus for opening folded, bound or stitched multi-sheet products, especially printed products. 4,420,146., Cl. 270-55.000.

Remon, Francis O., to USM Corporation. Retractable apparatus for shoe sole molds. 4,420,297., Cl. 425-577.000.

Rempfler, Hermann, to Ciba-Geigy Corporation. Derivatives of 5-(pyridyl-2-oxy)-2-nitrobenzoic acid, and herbicidal compositions containing them. 4,420,328., Cl. 71-94.000.

Repco Incorporated: *See*—
Horton, Harold O., Jr.; and Thompson, William B., 4,419,794., Cl. 24-667.000.

Research Association for Residual Oil Processing: *See*—
Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dentaro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332., Cl. 75-26.000.

Research Development Corporation of Japan: *See*—
Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; and Abe, Mitsuo, 4,420,348., Cl. 148-403.000.

Research, Incorporated: *See*—
Anderson, James R., 4,420,794., Cl. 361-419.000.

Reverte, Tomas M. Concealed safe. 4,419,939., Cl. 109-54.000.

Rexham Corporation: *See*—
Conley, Kenneth E., 4,420,527., Cl. 428-172.000.

Reynolds, Stephen: *See*—
Elton, Craig T.; and Reynolds, Stephen, 4,420,471., Cl. 424-49.000.

Rhoades, Thomas S.: *See*—
Scott, David R.; and Rhoades, Thomas S., 4,419,900., Cl. 73-862.060.

Rhone-Poulenc Industries: *See*—
Canard, Pierre; Latourrette, Bertrand; and Schorsch, Gilbert, 4,420,582., Cl. 524-450.000.

Rice, Edward J., to Acrian, Inc. Method of fabricating mesa MOSFET using overhang mask. 4,419,811., Cl. 29-571.000.

Richard, Henry J.: *See*—
Gidge, Kenneth N.; and Richard, Henry J., 4,420,027., Cl. 160-328.000.

Richards, Randall G., to Drackett Company, The. Passive dispenser. 4,419,771., Cl. 4-228.000.

Richardson-Vicks, Inc.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,420,483., Cl. 424-253.000.

Ricoh Company, Ltd.: *See*—
Nonaka, Mitsuhiro; and Kobayashi, Yuichi, 4,420,246., Cl. 355-14.00R.
Tabata, Yukio; and Kawanishi, Toshiyuki, 4,420,758., Cl. 346-76.0PH.
Umezawa, Michio, 4,420,150., Cl. 271-11.000.

Riebel, Hans-Jochem: *See*—
Hoffmann, Hellmut; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,420,435., Cl. 260-940.000.

Riedl, George, to Alcan International Limited. Method for controlling end effect on anodes used for cathodic protection and other applications. 4,420,382., Cl. 204-147.000.

Riese, W. A. Method of forming a heat exchanger tube. 4,419,802., Cl. 29-157.30A.

Rieter Machine Works Limited: *See*—
Schar, Hugo, 4,419,791., Cl. 19-215.000.

Riggs, Robert R.; and Hunt, Paulmer D., to Bendix Corporation, The. Pressure regulator for a fluid motor. 4,420,014., Cl. 137-468.000.

Rio, Eliseo M., Jr.: *See*—
Protacio, Alfredo C.; Navarro, Ramon V.; Rio, Eliseo M., Jr.; Alonte, Antonio D.; and Pascual, Felix J., 4,419,967., Cl. 123-1.00A.

Rio Vista International, Inc.: *See*—
Leibo, Stanley P., 4,419,986., Cl. 128-1.00R.

Ripple, Paul: *See*—
Law, Don C.; Mortenson, Carl N.; Ripple, Paul; and Eckhardt, Roger S., 4,420,166., Cl. 280-5.240.

Riseman, Jacob; and Tsang, Paul J., to International Business Machines Corporation. Fabrication process of sub-micrometer channel length MOSFETs. 4,419,809., Cl. 29-571.000.

Riseman, Jacob, to International Business Machines Corporation. Self-aligned field effect transistor process. 4,419,810., Cl. 29-571.000.

Roba, Giacomo, to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A. Nozzle for coating optical fibers. 4,419,958., Cl. 118-405.000.

Robbins Company, The: *See*—
Robbins, Richard J.; and Cass, David T., 4,420,188., Cl. 299-31.000.

Robbins, Richard J.; and Cass, David T., to Robbins Company, The. Double shield tunnel boring machine. 4,420,188., Cl. 299-31.000.

Robert Bosch GmbH: *See*—
Rehmann, Wolfgang; and Sauer, Rudolf, 4,420,738., Cl. 338-28.000.

Saur, Walter, 4,420,355., Cl. 156-250.000.
Zahn, Heinrich; and Falk, Gerhard, 4,420,109., Cl. 226-181.000.
Roberts, Roy G., to British Petroleum Company Limited, The. Bearing assembly for a tethered buoyant platform. 4,420,276., Cl. 405-224.000.
Robertson, Frank C.: *See*—
Fogg, Sidney G.; Robertson, Frank C.; and Wilson, Douglas, 4,420,573., Cl. 523-333.000.
Roccaforte, Harry L., to Champion International Corporation. Display card with concave panel. 4,420,077., Cl. 206-45.140.
Rockwell International Corporation: *See*—
Barclay, Kenneth M., 4,420,464., Cl. 423-65.000.
Hanowich, Peter J., 4,419,880., Cl. 73-3.000.
Holmstrom, Roy C.; and Liggett, John V., 4,419,885., Cl. 73-78.000.
James, Kenneth A.; Quick, William H.; August, Rudolf R.; and Strahan, Virgil H., 4,420,251., Cl. 356-32.000.
Schmidt, Donald F., 4,419,832., Cl. 33-329.000.
Tam, Matthias L.; and Custode, Frank Z., 4,419,808., Cl. 29-571.000.
Rodionov, Valery V.: *See*—
Belkin, German S.; Voskresensky, Stal N.; Kiselev, Viktor Y.; Lukatskaya, Ida A.; Rodionov, Valery V.; Skurikhin, Mikhail N.; Frolova, Irina B.; Zaev, Vyacheslav S.; Kornevv, Lev I.; Chervonenkis, Rauza A.; Rabinovich, Efim M.; Volkova, Tatyana P.; and Goryaev, German A., 4,420,346., Cl. 148-4.000.
Roger, Harry. Dual piston sensing mechanism. 4,420,011., Cl. 137-269.000.
Rogers, Arthur H.; Sullivan, Kevin J.; and Mansfield, Gerald R., to Medical and Scientific Designs Inc. Multi-anode deep well radiation detector. 4,420,689., Cl. 250-385.000.
Rogers Corporation: *See*—
Fukuda, Sunichi; and Muto, Masaaki, 4,420,653., Cl. 174-72.00B.
Rohm and Haas Company: *See*—
Hutton, Thomas W., 4,420,583., Cl. 524-501.000.
Rohner, Joachim; Zumfeld, Heinz; Mauries, Reinhard; and Preuhs, Hans-Jurgen, to W. Schlafhorst & Co. Thread splicing device. 4,419,858., Cl. 57-22.000.
Rohner, Joachim: *See*—
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860., Cl. 57-22.000.
Rohr, Jakob, to George Fischer Ltd. Cast vehicle wheel. 4,420,190., Cl. 301-63.00R.
Roland Corporation: *See*—
Dyck, Ralph; and Dunick, Peter, 4,419,918., Cl. 84-1.030.
Rollen, Donald C.: *See*—
Barrell, David; Kennedy, Donald E.; Marino, James J., *Jr.*; and Rollen, Donald C., 4,420,509., Cl. 427-206.000.
Rorer, David L.; and Hardin, Jasper E., to Teledyne Industries, Inc. Method of making an aircraft battery. 4,419,815., Cl. 29-623.200.
Rose, Carl J.: *See*—
Lake, Anthony W.; and Rose, Carl J., 4,420,639., Cl. 568-328.000.
Rosen, Klaus: *See*—
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860., Cl. 57-22.000.
Rossello, Henry S., to McDonnell Douglas Corporation. Visual display presentation box. 4,420,270., Cl. 402-76.000.
Roth, Kurt: *See*—
Buhler, Ulrich; Kindler, Horst; Kuhlein, Klaus; Kallay, Maria; Kosubek, Uwe; Lowenfeld, Rudolf; and Roth, Kurt, 4,420,308., Cl. 8-464.000.
Roussel Uclaf: *See*—
Heymes, Rene; and Lutz, Andre, 4,420,478., Cl. 424-246.000.
RTE Corporation: *See*—
Muench, Frank J., Jr., 4,420,735., Cl. 337-244.000.
Rubanov, Alexandr S.; Tanin, Leonid V.; Vasilieva, Ljudmila V.; Kalinin, Anatoly N.; Bursky, Vyacheslav A.; and Vidmant, Felix V., to Institut Fiziki an Bssr. Method of object imaging. 4,420,218., Cl. 350-3.850.
Ruch, Urs; and Dreier, Ernst, to Fritz Gegauf Aktiengesellschaft Bernina-Nahmaschinenfabrik. Feeder device for a sewing machine. 4,419,951., Cl. 112-323.000.
Rudolf, Peter: *See*—
Jakusch, Helmut; Loeser, Werner; Koester, Eberhard; Rudolf, Peter; Senkpiel, Werner; and Steck, Werner, 4,420,330., Cl. 75-0.5AA.
Ruetz, Lothar: *See*—
Uhrhan, Paul; Krauthausen, Edmund; Stahlke, Kurt-Rainer; Quaas, Gerwolf; and Ruetz, Lothar, 4,420,613., Cl. 544-51.000.
Rupertinger, Hermann: *See*—
Ackermann, Rolf; Jung, Friedrich; Mauer, Egon; and Rupertinger, Hermann, 4,420,269., Cl. 400-356.000.
Ruppert, Helmut; and Frase, Dietmar, to Thyssen Industrie AG; and SKF Kugellagerfabriken GmbH. Device for measuring the axial force in a shaft journalled by roller bearings. 4,419,901., Cl. 73-862.490.
Ruser, John R., to Shell Oil Company. Alaskan offshore drilling base. 4,420,275., Cl. 405-217.000.
Russell, Sid: *See*—
Dvorak, Herman G.; Klapatch, Robert D.; Russell, Sid; and Spaccini, Louis J., 4,419,863., Cl. 60-748.000.
Russo, Frank J., to Litco International Inc. Fork lift weighing apparatus. 4,420,053., Cl. 177-139.000.
Rybnicka Fabryka Maszyn Ryfama Przedsiebiorstwo Panstwowe: *See*—
Skolik, Wojciech; Wodecki, Jozef; Gortat, Zenon; Szyngiel, Stanislaw; Bulenda, Andrzej; and Sopora, Piotr, 4,420,075., Cl. 198-735.000.
Ryden, Sven A.: *See*—
Lussi, Eduard; Ahlstedt, Ulf L.; and Ryden, Sven A., 4,420,351., Cl. 156-62.400.
R2 Corporation: *See*—
Heath, Roger L., 4,419,998., Cl. 128-639.000.
Saad, Nabil R., to JWI Ltd. Pulp agitating device and method having multiple protruding inserts. 4,420,370., Cl. 162-209.000.
Sachs-Dolmar GmbH: *See*—
Bohlmann, Volker; and Kania, Norbert, 4,420,063., Cl. 181-229.000.
Saeed, Abdul R.: *See*—
Adam, Peter; Seuffert, Werner; and Saeed, Abdul R., 4,420,703., Cl. 310-154.000.
Sagehashi, Risaburo: *See*—
Yanai, Tadamasa; Sagehashi, Risaburo; Kameyama, Yoshio; and Shimomura, Takao, 4,420,162., Cl. 277-96.100.
Saguchi, Hiroto: *See*—
Hayama, Masashi; Saguchi, Hiroto; and Hirabayashi, Kenji, 4,420,537., Cl. 428-403.000.
Saizi, Mituhiro: *See*—
Inoue, Tomohiro; and Saizi, Mituhiro, 4,420,813., Cl. 364-513.000.
Sakai, Keijiro; Matsuda, Yasuo; and Honbu, Mitsuyuki, to Hitachi, Ltd. Control system for induction motor using inverter for AC power supply. 4,420,718., Cl. 318-729.000.
Sakai, Kiyoshi; Mabuchi, Minoru; Suzuki, Toshiko; Egarashi, Yuji; and Ishikawa, Shozo, to Canon Kabushiki Kaisha. Electrophotographic member with hydrazone or ketazine compounds. 4,420,548., Cl. 430-59.000.
Sakamoto, Akira: *See*—
Kawaguchi, Kiyoshi; Yamada, Muneki; Kato, Nobuyuki; Kanou, Fumio; Sakamoto, Akira; and Mitsuhashi, Minoru, 4,420,454., Cl. 264-512.000.
Sakamoto, Hitoshi, to Sony Corporation. Head tracking control system for a helical scan VTR. 4,420,778., Cl. 360-77.000.
Sakamoto, Tamotsu: *See*—
Okamura, Akio; Tanaka, Shuji; and Sakamoto, Tamotsu, 4,419,960., Cl. 118-712.000.
Sakurai, Yoshifumi, to Olympus Optical Co., Ltd. Magnetic head with an amorphous Hall element. 4,420,781., Cl. 360-112.000.
Salensky, George A.: *See*—
Mohr, Bernard; Pappas, Nicholas J.; Chopra, Kuldip S.; and Salensky, George A., 4,420,340., Cl. 106-288.00B.
Salle, Jacques E.; Jossif, Jean A. M.; Rathier, Gilbert J. M.; and Vales, Jean-Pierre, to Le Materiel Telephonique Thomson-CSF. Concentrator-deconcentrator devices. 4,420,832., Cl. 370-56.000.
Sallmann, Alfred; and Baschang, Gerhard, to Ciba-Geigy Corporation. Substituted phenylacetic acid amide compounds. 4,420,490., Cl. 424-309.000.
Salters, Roelof H. W.: *See*—
Koomen, Joannes J. M.; and Salters, Roelof H. W., 4,420,822., Cl. 365-182.000.
Samijn, Rafael P.: *See*—
Van Besauw, Jan F.; Leenders, Luc H.; D'hont, Dirk M.; Kokelenberg, Hendrik E.; and Samijn, Rafael P., 4,420,553., Cl. 430-275.000.
Sanders Associates, Inc.: *See*—
Fuller, Harrison W., 4,419,895., Cl. 73-517.00A.
Marshall, William J., Jr.; and White, Ronald P., 4,420,826., Cl. 367-167.000.
Maynard, Robert L.; Ballard, Samuel S.; and Townsend, Robert L., 4,420,825., Cl. 367-122.000.
Sanderson, John R.; Brader, Walter H., Jr.; and Watts, Lewis W., Jr., to Texaco, Inc. Alkylene oxides produced by direct oxidation of olefins over transition metal borates in the presence of a non-polar, aromatic organic solvent. 4,420,625., Cl. 549-533.000.
Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,419,869., Cl. 68-5.00D.
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, to Sando Iron Works Co., Ltd. Apparatus for treating a cloth with the use of low-temperature plasma. 4,419,869., Cl. 68-5.00D.
Sandoz, Inc.: *See*—
Damon, Robert E., II, 4,420,475., Cl. 424-184.000.
Sands, Bruce W., to PQ Corporation. Manufacturing process for hollow microspheres. 4,420,442., Cl. 264-13.000.
Sangamo Weston Limited: *See*—
Dorey, Howard A.; and Ley, Anthony J., 4,420,721., Cl. 324-110.000.
Sano, Ken-ichi: *See*—
Mita, Yukimitsu; Sano, Ken-ichi; Matsuhira, Shinya; and Nakajo, Tetsuo, 4,420,420., Cl. 502-261.000.
Sano, Tatsuhiko: *See*—
Amano, Takehiro; Ogawa, Toshihisa; Yoshikawa, Kensei; Shiobara, Yoshinori; Sano, Tatsuhiko; Ohuchi, Yutaka; Tanami, Tohru; Ito, Shoichi; and Sawada, Jiro, 4,420,631., Cl. 560-104.000.
Santalla, Richard W., to Combustion Engineering, Inc. Supplying pulverized coal to a coal-fired furnace. 4,419,941., Cl. 110-232.000.
Sarafian, Karl: *See*—
Vis, Arthur D.; and Sarafian, Karl, 4,420,199., Cl. 339-8.00R.

Sarasota Automation Limited: *See*—
Zanker, Klaus J.; and Anderson, Gerald, 4,419,898., Cl. 73-861.020.
Sasaki, Kinji: *See*—
Kajimoto, Norifumi; and Sasaki, Kinji, 4,420,408., Cl. 256-62.540.
Sasaki, Takuya: *See*—
Okouchi, Isao; Takahashi, Sankichi; Mukai, Yasuteru; Otake, Katsumoto; Sasaki, Takuya; and Miyai, Masahiko, 4,420,038., Cl. 165-95.000.
Sato, Akihiro; Kikuta, Kazutsune; Matsuda, Kenji; Uwai, Toshihiro; and Hanari, Tohru, to Chisso Corporation. Process for producing α-olefin polymers. 4,420,593., Cl. 526-128.000.
Sato, Hiroshi, to Daiichi Electric Co., Ltd. FM Data recording and playback method and apparatus. 4,420,774., Cl. 360-28.000.
Sato, Kunio, to Casio Computer Co., Ltd. Power saving device for an electronic musical instrument. 4,419,917., Cl. 84-1.010.
Sato, Yoshito; Chiba, Kazukiyo; and Matsumoto, Minoru, to Kabushiki Kaisha Komatsu Seisakusho. Radiator guard structure for vehicles. 4,420,058., Cl. 180-68.00P.
Sauer, Rudolf: *See*—
Rehmann, Wolfgang; and Sauer, Rudolf, 4,420,738., Cl. 338-28.000.
Sauers, Richard F., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,420,325., Cl. 71-92.000.
Saunders, Hollis S.; and Payette, Lionel J., to Essex Group, Inc. Self-bonding magnet wire. 4,420,536., Cl. 428-383.000.
Saur, Walter, to Bedford Industries, Inc.; and Robert Bosch GmbH. Ribbon applicator head. 4,420,355., Cl. 156-250.000.
Sautter, Joachim: *See*—
Kindt, Emanuel; and Sautter, Joachim, 4,420,358., Cl. 156-356.000.
Savides, Christos; and Bright, John H., to American Cyanamid Company. Extraction of phenols from aqueous solutions. 4,420,643., Cl. 568-753.000.
Savin Corporation: *See*—
Baker, James M.; and Vermaat, David L., 4,420,243., Cl. 355-3.0TR.
Landa, Benzion, 4,420,244., Cl. 355-3.0TR.
Schultes, Max; and Eberlein, Dietmar, 4,420,149., Cl. 271-10.000.
Sawa, Yuji: *See*—
Okada, Shingo; Sawa, Yuji; and Adachi, Kuniomi, 4,419,854., Cl. 53-434.000.
Sawada, Jiro: *See*—
Amano, Takehiro; Ogawa, Toshihisa; Yoshikawa, Kensei; Shiobara, Yoshinori; Sano, Tatsuhiko; Ohuchi, Yutaka; Tanami, Tohru; Ito, Shoichi; and Sawada, Jiro, 4,420,631., Cl. 560-104.000.
Sawada, Takao: *See*—
Muto, Katsutoshi; Sawada, Takao; and Komine, Yoshiharu, 4,419,889., Cl. 73-336.500.
Sawamura, Norio: *See*—
Matsuo, Takaharu; Sawamura, Norio; Hashimoto, Yukio; and Hashida, Wataru, 4,420,560., Cl. 435-134.000.
Scale-Tronix, Inc.: *See*—
Hale, David C., 4,420,052., Cl. 177-132.000.
Scalf, Gerald W.; and Koberlein, James H., to Texas Instruments Incorporated. Data input apparatus for microwave oven controllers. 4,420,669., Cl. 219-10.55B.
Scapa Dryers, Inc.: *See*—
Westhead, William T., 4,420,529., Cl. 428-244.000.
Schar, Hugo, to Rieter Machine Works Limited. Method of unrolling and piecing a lap. 4,419,791., Cl. 19-215.000.
Scharmann GmbH & Co.: *See*—
Esser, Karl-Josef, 4,419,806., Cl. 29-568.000.
Scheerer, Joachim: *See*—
Grutzediek, Hartmut; Scheerer, Joachim; Knothe, Erich; and Melcher, Franz-Josef, 4,420,055., Cl. 177-212.000.
Schenectady Chemicals, Inc.: *See*—
Walrath, George A.; and Smith, Scott D., 4,420,535., Cl. 428-379.000.
Scheve, Bernard J., to Hercules Incorporated. Stabilization of irradiated carboxymethyl cellulose. 4,420,611., Cl. 536-88.000.
Schiebold, Cristopher F.; and Green, William R., to Watkins-Johnson Company. Controlled voltage yttrium iron garnet (YIG) resonator apparatus. 4,420,731., Cl. 333-219.000.
Schiel, Lothar: *See*—
Hammer, Josef; Schiel, Lothar; and Kratt, Hans, 4,420,495., Cl. 426-564.000.
Schilling, Hermann; and Stief, Reinhard, to Carl Freudenberg, Firma. Sound absorbing irregularly shaped panel. 4,420,526., Cl. 428-171.000.
Schimitzek, Gunter; and Reiche, Horst. Apparatus for grinding optical lenses. 4,419,846., Cl. 51-55.000.
Schirk, Guter: *See*—
Kastl, Alfons; Lehnert, Klaus; Koninger, Horst; and Schirk, Guter, 4,420,241., Cl. 354-319.000.
Schlichting, Robert: *See*—
Hanson, James M.; and Schlichting, Robert, 4,420,286., Cl. 414-539.000.
Schlosser, Willem: *See*—
van Dalen, Hendrik; and Schlosser, Willem, 4,420,452., Cl. 264-328.800.
Schmidt, Donald F., to Rockwell International Corporation. Aircraft attitude display instrument. 4,419,832., Cl. 33-329.000.
Schmidt, Hans-Georg, to Dynamit Nobel AG. Method of preparing 3-alkyl-6-methyl-β-resorcylic acid esters. 4,420,629., Cl. 560-70.000.
Schmidt, Peter. Bathtub assembly for handicapped persons. 4,419,776., Cl. 4-564.000.
Schmitt, Frederick L.: *See*—
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,420,423., Cl. 252-522.00R.
Schmitt, Kirk D., to Mobil Oil Corporation. Method for determining flow patterns in subterranean petroleum and mineral containing formations. 4,420,565., Cl. 436-27.000.
Schmitt, Walter, to Dr. Johannes Heidenhain GmbH. Frequency to voltage converter for a digital tachometer. 4,420,699., Cl. 307-519.000.
Schneider, Manfred: *See*—
Opitz, Konrad; Grossmann, Max; Kruse, Hurbert; Schneider, Manfred; and Uhrig, Heinz, 4,420,310., Cl. 8-560.000.
Schoening, Josef: *See*—
Nickel, Walter; Schoening, Josef; and Schwiers, Hans-Georg, 4,420,456., Cl. 376-245.000.
Schoettle, Klaus: *See*—
Gliniorz, Lothar; Dobler, Peter; Schoettle, Klaus; Flohr, Joachim; and Maerthesheimer, Rolf, 4,420,079., Cl. 206-387.000.
Scholl, Hans: *See*—
Fischer, Jochen; and Scholl, Hans, 4,419,946., Cl. 112-121.120.
Scholz, Donald T. Electronic component mounting. 4,420,795., Cl. 361-427.000.
Schorsch, Gilbert: *See*—
Canard, Pierre; Latourrette, Bertrand; and Schorsch, Gilbert, 4,420,582., Cl. 524-450.000.
Schriewer, Helmut: *See*—
Hartmann, Randolph; and Schriewer, Helmut, 4,420,320., Cl. 71-13.000.
Schroeder, James E.; and Shlichta, Paul J., to United States of America, National Aeronautics and Space Administration. Absorbable-susceptor joining of ceramic surfaces. 4,420,352., Cl. 156-89.000.
Schulte, Wilfried: *See*—
Bergner, Dieter; Hannesen, Kurt; Schulte, Wilfried; and Steinmetz, Peter, 4,420,387., Cl. 204-263.000.
Schultes, Max; and Eberlein, Dietmar, to Savin Corporation. Automatic original document feeder for electrophotographic copier. 4,420,149., Cl. 271-10.000.
Schurfeld, Armin: *See*—
Hartel, Gunter; Schurfeld, Armin; and Abidin, Anwar, 4,420,439., Cl. 261-142.000.
Schutt, Eduard; and Hell, Gunter, to Aristo Graphic Systeme GmbH & Co., KG. Method of cutting patterns in web material. 4,419,913., Cl. 83-27.000.
Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung: *See*—
Brauer, Hans-Martin, 4,420,179., Cl. 295-15.000.
Schwartz, John G.: *See*—
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Gustafson, Manfred, 4,420,280., Cl. 407-109.000.
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Seyffert, Michael; and d'Entremont, Alan F., to National Semiconductor Corp. Lead frame advance system. 4,420,107., Cl. 226-32.000.
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Valimont, James L.; and Shadle, Barry L., 4,420,361., Cl. 156-556.000.
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Nukii, Takashi; Nakabu, Shigeo; Iwasaki, Masaru; and Awane, Katsunobu, 4,420,364., Cl. 156-631.000.
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Shay, Gregory D., to Sherwin-Williams Company, The. Radiation polymerizable compounds and conductive coatings from same. 4,420,541., Cl. 428-523.000.
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Ruser, John R., 4,420,275., Cl. 405-217.000.
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Siciliano, Anthony J., to Diamond Automations, Inc. Door construction for poultry cage. 4,419,962., Cl. 119-17.000.
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Siebold, Donald J.; Troy, Michael K.; and Lenz, William R., to Molex Incorporated. Connector assembly for a piezoelectric transducer. 4,420,706., Cl. 310-324.000.
Siegal, Burton L., to Kiwi Coders Corporation. Reciprocable imprinting apparatus. 4,419,931., Cl. 101-333.000.
Siegel, Carole E.: *See*—
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Locher, Gunter, 4,420,367., Cl. 156-651.000.
Reis, Edmund; and Wondra, Arthur, 4,420,209., Cl. 339-91.00R.
Teich, Dieter, 4,420,651., Cl. 174-50.000.
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Blaser, Hans U., 4,420,015., Cl. 137-852.000.
Sigloch, K. Eugen; and Stark, Gerhard. Machining center. 4,419,797., Cl. 29-26.00A.
Sigman, William T.: *See*—
Bolgiano, Nicholas C.; and Sigman, William T., 4,420,499., Cl. 427-53.100.
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Koomen, Joannes J. M.; and Salters, Roelof H. W., 4,420,822., Cl. 365-182.000.
Preedy, David R., 4,420,820., Cl. 365-105.000.
Silhouette, Jean-Max M., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.". System for successively producing hydraulic fluid flows at staggered values. 4,420,289., Cl. 417-216.000.
Silly, Didier Jean-Pierre: *See*—
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Silvilotti, Olivo G.; and Iseki, Junkichi, to Alcan International Limited. Electrolytic method and cell for metal production. 4,420,381., Cl. 204-70.000.
Simanski, Edward G. Piano keyboard shield. 4,419,921., Cl. 84-467.000.
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Ruppert, Helmut; and Frase, Dietmar, 4,419,901., Cl. 73-862.490.
Skolik, Wojciech; Wodecki, Jozef; Gortat, Zenon; Szyngiel, Stanislaw; Bulenda, Andrzej; and Sopora, Piotr, to Rybnicka Fabryka Maszyn Ryfama Przedsiebiorstwo Panstwowe. Connecting member for chutes of chain-and-flight conveyors. 4,420,075., Cl. 198-735.000.
Skurikhin, Mikhail N.: *See—*
Belkin, German S.; Voskresensky, Stal N.; Kiselev, Viktor Y.; Lukatskaya, Ida A.; Rodionov, Valery V.; Skurikhin, Mikhail N.; Frolova, Irina B.; Zuev, Vyacheslav S.; Kornevv, Lev I.; Chervonenkis, Rauza A.; Rabinovich, Efim M.; Volkova, Tatyana P.; and Goryaev, German A., 4,420,346., Cl. 148-4.000.
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Smester, Paul R.; and Price, Edison A., to Edison Price, Incorporated. Lighting fixture with thermal protector bracket. 4,420,802., Cl. 362-364.000.
Smith, Clark K. Water saver. 4,419,772., Cl. 4-364.000.
Smith, Eldred T.: *See—*
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Smith, LaVerne D., to Outboard Marine Corporation. Lawn mower with combined engine brake and ignition control. 4,419,857., Cl. 56-11.300.
Smith, Scott D.: *See—*
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Kost, Erwin; and Folta, Werner, 4,420,287., Cl. 414-729.000.
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Societe Anonyme DBA: *See—*
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Societe Anonyme de Telecommunications: *See—*
Albagnac, Rene D. M.; and Silly, Didier Jean-Pierre, 4,419,867., Cl. 62-514.0JT.
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Societe Chimique des Charbonnages-CdF Chimie: *See—*
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Somal, Hardev S., to Maatschappij Van Berkel's Patent N.V. Constant strain load cell. 4,419,902., Cl. 73-862.650.
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Sakamoto, Hitoshi, 4,420,778., Cl. 360-77.000.
Takano, Yoshikazu; Kamimura, Tomohisa; and Fujikawa, Mitsunobu, 4,420,779., Cl. 360-92.000.
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Speer, Herbert. Bridge pad assembly for metal spectacle frames. 4,420,227., Cl. 351-138.000.
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Springer, Lamar D.: *See—*
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Springer, Richard A.: *See—*
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van Dalen, Hendrik; and Schlosser, Willem, 4,420,452., Cl. 264-328.800.
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Steffen, Cennert O., to Aktiebolaget Electrolux. Remote control for a vacuum cleaner motor. 4,419,783., Cl. 15-339.000.
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Sterling Drug Inc.: *See—*
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Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,420,617., Cl. 546-257.000.
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Stewart, Nelson. Process for recovering vaporized solvent which eliminates heat exchangers. 4,420,317., Cl. 62-20.000.

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Stiftelsen Institutet for Mikrovagsteknik vid Tekniska Hogskolan: *See*—
Andermo, Nils I., 4,420,754., Cl. 340-870.370.

Stone, Wayne B., Jr., to Wood Manufacturing Co., Inc. Decanter for reducing oxidation and evaporation of coffee. 4,419,927., Cl. 99-275.000.

Stoy, Vladimir A. Polymer composition including polyacrylonitrile polymers and process for preparing same. 4,420,589., Cl. 525-93.000.

Strahan, Virgil H.: *See*—
James, Kenneth A.; Quick, William H.; August, Rudolf R.; and Strahan, Virgil H., 4,420,251., Cl. 356-32.000.

Strain, Don R., to H.D. Research Company. Hair dryer. 4,419,835., Cl. 34-80.000.

Strand, Olaf; Omdal, Bjarne; and Svendsen, Jens, to Norsk Hydro A/S. Method and apparatus for filling of flexible containers. 4,420,021., Cl. 141-10.000.

Strandberg, Lars, to ASEA Aktiebolag. Electrical equipment. 4,420,793., Cl. 361-413.000.

Strandell, Per Olof: *See*—
Frykendahl, Bjorn, 4,420,031., Cl. 164-473.000.

Stratton, Andrew: *See*—
Kirby, Ian J.; Mitchell, Michael I.; and Stratton, Andrew, 4,419,933., Cl. 102-206.000.

Stricker, Walter: *See*—
Peroutka, Fritz; Thumm, Helmut; Bahr, Theodor; and Stricker, Walter, 4,420,117., Cl. 241-46.170.

Strobel, Harald M.: *See*—
Horoldt, Ernst; Vollmuller, Helmut; Bernhard, Heinz D.; and Strobel, Harald M., 4,420,572., Cl. 523-322.000.

Stroupe, Stephen D.: *See*—
Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., 4,420,568., Cl. 436-536.000.

Stumpf, Gunter O. Material cutting machine. 4,419,820., Cl. 30-124.000.

Su, Hsueh-Ling: *See*—
Chang, Ching-Te; Lee, Lian-Tze; and Su, Hsueh-Ling, 4,420,430., Cl. 260-429.00R.

Sudo, Ryoichi: *See*—
Nakatani, Mitsuo; Yamazaki, Mitsuo; Okunaka, Masaaki; Sudo, Ryoichi; Tochigi, Kenji; and Yokono, Hitoshi, 4,420,500., Cl. 427-54.100.

Sueyoshi, Susumu; and Ishikawa, Kikuo, to Pioneer Electronic Corporation. Wide-bandwidth low-distortion amplifier. 4,420,725., Cl. 330-288.000.

Suezawa, Takahiko; Koizumi, Satoru; Nakao, Hiroaki; and Tsuchitani, Takashi, to Sharp Kabushiki Kaisha. Mode selector assembly for use in tape recorders. 4,420,783., Cl. 360-137.000.

Sugai, Hideo: *See*—
Ogawa, Masahide; Masuko, Tetsuo; Goto, Kunio; Sugai, Hideo; and Takahashi, Masao, 4,420,419., Cl. 252-455.00Z.

Suling, Carlhans: *See*—
Bomer, Bruno; Suling, Carlhans; Konig, Joachim; Hespe, Hans; Heynemann, Carl; and Weber, Raimund, 4,420,225., Cl. 350-409.000.

Sullivan, Donald E. Adjustable tank discharge valve for controlling flush water volume. 4,419,773., Cl. 4-392.000.

Sullivan, Kevin J.: *See*—
Rogers, Arthur H.; Sullivan, Kevin J.; and Mansfield, Gerald R., 4,420,689., Cl. 250-385.000.

Sumi, Akihiko: *See*—
Chibata, Ichiro; Sumi, Akihiko; Ito, Hiroshi; Ohtsuki, Osamu; and Izutsu, Nozomu, 4,420,432., Cl. 260-501.110.

Sumitomo, Hidehiko: *See*—
Ueda, Masanori; Sumitomo, Hidehiko; and Yoshimura, Hirofumi, 4,420,347., Cl. 148-12.00E.

Sung, Rodney L.; Zoleski, Benjamin H.; Cullen, William P.; and Kablaoui, Mahmoud S., to Texaco Inc. Method of lubricating upper cylinder of marine diesel engine. 4,420,407., Cl. 252-33.400.

Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Richardson-Vicks, Inc. Analgesic and anti-inflammatory compositions comprising ibuprofen and methods of using same. 4,420,483., Cl. 424-253.000.

Surko, Walter E., Jr., to Emhart Industries, Inc. Door closer assembly. 4,419,786., Cl. 16-51.000.

Suzuki, Akitoshi: *See*—
Shiga, Shoji; Suzuki, Akitoshi; Goma, Yasuo; and Kawada, Kenji, 4,420,377., Cl. 204-28.000.

Suzuki, Atsushi: *See*—
Yamada, Hiromichi; Suzuki, Atsushi; Oba, Yoichi; Uchida, Yoko; Kohno, Hideki; Fukino, Tadashi; and Yoshida, Minoru, 4,420,444., Cl. 264-21.000.

Suzuki, Koji; Nakahira, Joji; Kuroda, Koki; Nagashima, Nao; and Takayanagi, Yoshiaki, to Canon Kabushiki Kaisha. Computer control means for an electrostatic recording apparatus. 4,420,247., Cl. 355-14.00C.

Suzuki, Kunihiko, to Nissan Motor Company, Limited. Vehicle drive system. 4,420,059., Cl. 180-248.000.

Suzuki, Seiichi: *See*—
Jikihara, Tetsuo; Oda, Masatsugu; Ushinohama, Kazuyuki; Watanabe, Hisao; and Suzuki, Seiichi, 4,420,327., Cl. 71-96.000.

Suzuki, Takuya, to Nippon Gakki Seizo Kabushiki Kaisha. Circuit to compensate for deficit of output characteristics of a microphone by output characteristics of associated other microphones. 4,420,655., Cl. 381-94.000.

Suzuki, Toshiko: *See*—
Sakai, Kiyoshi; Mabuchi, Minoru; Suzuki, Toshiko; Egarashi, Yuji; and Ishikawa, Shozo, 4,420,548., Cl. 430-59.000.

Svendsen, Jens: *See*—
Strand, Olaf; Omdal, Bjarne; and Svendsen, Jens, 4,420,021., Cl. 141-10.000.

Svenska Traforsknings institutet: *See*—
Fladda, Gerdt; and Pettersson, Thorulf, 4,420,256., Cl. 356-336.000.

Sykes, Richard B., to E. R. Squibb & Sons, Inc. Synergistic antifungal compositions. 4,420,474., Cl. 424-121.000.

Synergistics Chemicals Limited: *See*—
Crocker, Zenas; and Wright, A. Nelson, 4,420,449., Cl. 264-68.000.

Szymaszek, Paul G., to Vilter Manufacturing Company. Oil cooling apparatus for refrigeration screw compressor. 4,419,865., Cl. 62-193.000.

Szyngiel, Stanislaw: *See*—
Skolik, Wojciech; Wodecki, Jozef; Gortat, Zenon; Szyngiel, Stanislaw; Bulenda, Andrzej; and Sopora, Piotr, 4,420,075., Cl. 198-735.000.

T.C.A., Inc.: *See*—
Lee, Quarterman; Watson, Larry E.; and Montgomery, Glenn E., 4,420,003., Cl. 134-80.000.

Tabata, Yukio; and Kawanishi, Toshiyuki, to Ricoh Company, Ltd. Electrothermic non-impact recording method and apparatus. 4,420,758., Cl. 346-76.0PH.

Taber, Bruce E.: *See*—
Price, Robert J.; and Taber, Bruce E., 4,420,819., Cl. 364-900.000.

Tabler, Donald C.: *See*—
Beckworth, Alden E.; Howell, Jerald A.; and Tabler, Donald C., 4,420,389., Cl. 208-251.00R.

Tachibana, Eiichi; and Katsuta, Tetsuro, to Dai Nippon Insatsu Kabushiki Kaisha. One-bath etching method for processing gravure plate, and etching condition calculating device. 4,420,363., Cl. 156-627.000.

Tadauchi, Masaharu; Tanno, Kiyohiko; and Nakano, Taizoh, to Hitachi, Ltd.; and Nippon Telegraph & Telephone Public Corporation. Scan signal processing system. 4,420,742., Cl. 340-347.0AD.

Taiho Kogyo Co., Ltd.: *See*—
Takenaka, Akira; and Fukuoka, Tatsuhiko, 4,420,163., Cl. 277-96.100.

Taisho Pharmaceutical Co., Ltd.: *See*—
Amano, Takehiro; Ogawa, Toshihisa; Yoshikawa, Kensei; Shiobara, Yoshinori; Sano, Tatsuhiko; Obuchi, Yutaka; Tanami, Toru; Ito, Shoichi; and Sawada, Jiro, 4,420,631., Cl. 560-104.000.

Takada, Sanae: *See*—
Ohyama, Hiroshi; Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Takada, Sanae; Morita, Ken; Wada, Takuo; Miyahara, Masahiko; and Arakawa, Masazumi, 4,420,486., Cl. 424-272.000.

Takagi, Tomio; Ueda, Jitsuhiko; Fujii, Tadaomi; and Tanaka, Kazuhiko, to Hitachi Shipbuilding & Engineering Company Limited. Materials for rolls. 4,420,335., Cl. 75-124.000.

Takahashi, Atsushi; Muratsubaki, Yoshiharu; and Ishizaka, Hiroyuki, to Nippon Carbide Kogyo Kabushiki Kaisha. Powdery desulfurizer composition. 4,420,333., Cl. 75-55.000.

Takahashi, Masao: *See*—
Ogawa, Masahide; Masuko, Tetsuo; Goto, Kunio; Sugai, Hideo; and Takahashi, Masao, 4,420,419., Cl. 252-455.00Z.

Takahashi, Sankichi: *See*—
Okouchi, Isao; Takahashi, Sankichi; Mukai, Yasuteru; Otake, Katsumoto; Sasaki, Takuya; and Miyai, Masahiko, 4,420,038., Cl. 165-95.000.

Takahashi, Shinji: *See*—
Kaneko, Yasuyuki; Itoh, Masao; and Takahashi, Shinji, 4,420,397., Cl. 210-611.000.

Takahashi, Soichi; and Kobayashi, Susumu, to Victor Company of Japan, Limited. Circuit arrangement for different color light emission. 4,420,711., Cl. 315-296.000.

Takahashi, Toshihiro, to Toko Kabushiki Kaisha. Display type push button. 4,420,664., Cl. 200-308.000.

Takai, Toshiaki: *See*—
Masuda, Yutaka; Takai, Toshiaki; and Tohyama, Shunroku, 4,420,522., Cl. 428-95.000.

Takakura, Koichi: *See*—
Tanihara, Masao; Nakashima, Toshihide; and Takakura, Koichi, 4,420,395., Cl. 210-263.000.

Takano, Yoshikazu; Kamimura, Tomohisa; and Fujikawa, Mitsunobu, to Sony Corporation. Automatic cassette changer. 4,420,779., Cl. 360-92.000.

Takasaki, Yasuto: *See*—
Nakatani, Genji; Kansi, Kazuo; Itoh, Haruo; Takasaki, Yasuto; Ohkoshi, Kenji; and Yanagida, Yoshinobu, 4,420,304., Cl. 432-83.000.

Takata, Akira: *See*—
Hattori, Tadashi; Yoshida, Hitoshi; Akutagawa, Keichi; Takata, Akira; and Fukuda, Tamotsu, 4,419,972., Cl. 123-337.000.

Takaya, Takao; Inoue, Yoshikazu; Yasuda, Nobuyoshi; and Murata, Masayoshi, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,420,477., Cl. 424-246.000.

Takayanagi, Yoshiaki: *See*—
Suzuki, Koji; Nakahira, Joji; Kuroda, Koki; Nagashima, Nao; and Takayanagi, Yoshiaki, 4,420,247., Cl. 355-14.00C.

Take, Hiroshi: *See—*
Koyanagi, Katubumi; Hamada, Hiroshi; Yano, Kohzo; Take, Hiroshi; and Inami, Yasuhiko, 4,420,749., Cl. 340-763.000.

Takebe, Yoshiharu: *See—*
Yamamoto, Sueshi; Nagata, Kenichi; Tanimichi, Jisaku; and Takebe, Yoshiharu, 4,420,445., Cl. 264-40.400.

Takehara, Hideaki, to Victor Company of Japan, Limited. Method for making a stylus having a conductive carbon layer and a stylus made by the method. 4,420,675., Cl. 219-121.0LM.

Takenaka, Akira; and Fukuoka, Tatsuhiko, to Taiho Kogyo Co., Ltd. Mechanical seal. 4,420,163., Cl. 277-96.100.

Takenaka, Michio: *See—*
Yamashita, Hajime; and Takenaka, Michio, 4,419,801., Cl. 29-156.4WL.

Takeuchi, Tomio: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; and Ishii, Kiyoto, 4,420,473., Cl. 424-118.000.

Takiue, Yukihiro: *See—*
Arikawa, Tetsuro; Inoue, Teruo; and Takiue, Yukihiro, 4,420,814., Cl. 364-565.000.

Talon, Inc.: *See—*
Moertel, George B., 4,419,793., Cl. 24-413.000.

Tam, Matthias L.; and Custode, Frank Z., to Rockwell International Corporation. Method of producing redundant ROM cells. 4,419,808., Cl. 29-571.000.

Tamai, Yasuo: *See—*
Ogawa, Hiroshi; and Tamai, Yasuo, 4,420,540., Cl. 428-457.000.

Tamura, Masanori: *See—*
Ueno, Haruo; Yano, Takefumi; Shimizu, Michimasa; Tamura, Masanori; and Yuasa, Sakae, 4,420,594., Cl. 526-128.000.

Tamura, Masuhiko: *See—*
Matsumoto, Mitsuo; Yoshimura, Noriaki; and Tamura, Masuhiko, 4,420,640., Cl. 568-454.000.

Tanabe Seiyaku Co., Ltd.: *See—*
Chibata, Ichiro; Sumi, Akihiko; Ito, Hiroshi; Ohtsuki, Osamu; and Izutsu, Nozomu, 4,420,432., Cl. 260-501.110.
Inoue, Hirozumi; and Hashiyama, Tomiki, 4,420,628., Cl. 560-17.000.

Tanahashi, Toshio: *See—*
Tsuzuki, Yoshihiko; Uchida, Kiyoshi; and Tanahashi, Toshio, 4,419,925., Cl. 92-212.000.

Tanaka, Haruhiko: *See—*
Makabe, Hachiro; Hagiwara, Muneaki; and Tanaka, Haruhiko, 4,419,947., Cl. 112-158.00E.

Tanaka, Hiroshi: *See—*
Oka, Koichiro; Tanaka, Hiroshi; and Harigae, Makoto, 4,420,366., Cl. 156-644.000.

Tanaka, Itsuo: *See—*
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,419,869., Cl. 68-5.00D.

Tanaka, Kazuhiko: *See—*
Takagi, Tomio; Ueda, Jitsuhiko; Fujii, Tadaomi; and Tanaka, Kazuhiko, 4,420,335., Cl. 75-124.000.

Tanaka, Shuji: *See—*
Okamura, Akio; Tanaka, Shuji; and Sakamoto, Tamotsu, 4,419,960., Cl. 118-712.000.

Tanaka, Toshie: *See—*
Yamamoto, Kiyokazu; Hiratsuka, Ko; Tanaka, Toshie; and Iwasaki, Shigeyuki, 4,420,396., Cl. 210-416.400.

Tanami, Tohru: *See—*
Amano, Takehiro; Ogawa, Toshihisa; Yoshikawa, Kensei; Shiobara, Yoshinori; Sano, Tatsuhiko; Ohuchi, Yutaka; Tanami, Tohru; Ito, Shoichi; and Sawada, Jiro, 4,420,631., Cl. 560-104.000.

Taniguchi, Nobuyuki; Hoda, Takeo; Oyokota, Shigeru; and Seigenji, Koyoshi, to Minolta Camera Kabushiki Kaisha. Camera for use with film having sprocket holes and/or coded perforations. 4,420,236., Cl. 354-21.000.

Tanihara, Masao; Nakashima, Toshihide; and Takakura, Koichi, to Kuraray Co., Ltd. Blood purification device. 4,420,395., Cl. 210-263.000.

Tanimichi, Jisaku: *See—*
Yamamoto, Sueshi; Nagata, Kenichi; Tanimichi, Jisaku; and Takebe, Yoshiharu, 4,420,445., Cl. 264-40.400.

Tanin, Leonid V.: *See—*
Rubanov, Alexandr S.; Tanin, Leonid V.; Vasilieva, Ljudmila V.; Kalinin, Anatoly N.; Bursky, Vyacheslav A.; and Vidmant, Felix V., 4,420,218., Cl. 350-3.850.

Taniuchi, Mamoru: *See—*
Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dentaro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332., Cl. 75-26.000.

Tanno, Kiyohiko: *See—*
Tadauchi, Masaharu; Tanno, Kiyohiko; and Nakano, Taizoh, 4,420,742., Cl. 340-347.0AD.

Tarjan, Peter P., to Cordis Corporation. Cardiac pacer apparatus. 4,419,996., Cl. 128-419.0PG.

Tarkett AB: *See—*
Lussi, Eduard; Ahlstedt, Ulf L.; and Ryden, Sven A., 4,420,351., Cl. 156-62.400.

Tarnay, Matthew G.; and LaBelle, John T., to Price-Pfister Brass Mfg. Co. Water temperature and flow rate selection display and control system and method. 4,420,811., Cl. 364-510.000.

Tarng, Ming L., to RCA Corporation. Multi-layer passivant system. 4,420,765., Cl. 357-54.000.

Tatani, Atsushi: *See—*
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; Oshima, Michio; Okino, Susumu; and Shigeta, Sadaichi, 4,420,465., Cl. 423-242.000.

Taylor, Clyde L. Seed harvesting apparatus. 4,419,856., Cl. 56-1.000.

Taylor, Frank; and Maurer, Klemens, to Monitronik Ltee. Diagram board element. 4,419,838., Cl. 40-605.000.

Taylor, Gerald M.; and Emms, Norman R., to Item Products Limited. Removable fixing device. 4,420,178., Cl. 294-158.000.

Taylor, Henry F., to United States of America, Navy. Double coupled dual input rate sensor. 4,420,259., Cl. 356-350.000.

Taylor, Leonard S., to University of Maryland. Method for shucking bivalve mollusks using microwave energy. 4,420,492., Cl. 426-241.000.

Taylor, Robert B.: *See—*
McFarlane, Finley E.; and Taylor, Robert B., 4,420,581., Cl. 524-431.000.

Taylor, Wayne A. Trailer hitch. 4,420,169., Cl. 280-446.00R.

TDK Electronics Co. Ltd.: *See—*
Hayama, Masashi; Saguchi, Hiroto; and Hirabayashi, Kenji, 4,420,537., Cl. 428-403.000.
Kajimoto, Norifumi; and Sasaki, Kinji, 4,420,408., Cl. 256-62.540.
Okamura, Masatoshi; and Shiba, Haruo, 4,420,128., Cl. 242-199.000.
Tokuda, Fuminori, 4,420,531., Cl. 428-329.000.

Techsonic Industries, Inc.: *See—*
Andrews, Wayne S., 4,420,762., Cl. 346-136.000.

Teich, Dieter, to Siemens Aktiengesellschaft. Proximity switch operable without physical contact. 4,420,651., Cl. 174-50.000.

Teikoku Piston Ring Co., Ltd.: *See—*
Kondo, Katsumi; Fuwa, Yoshio; Harayama, Akira; and Nakahora, Toru, 4,420,543., Cl. 428-564.000.

Tekno-Detaljer Sture Carlsson AB: *See—*
Astrom, Erik J. H., 4,420,012., Cl. 137-319.000.

Teledyne Industries, Inc.: *See—*
Martinez, Mark S.; and Pust, Harold W., 4,420,687., Cl. 250-343.000.
Rorer, David L.; and Hardin, Jasper E., 4,419,815., Cl. 29-623.200.

Telegin, Vasily D.: *See—*
Kostikov, Valery I.; Koshelev, Jury I.; Telegin, Vasily D.; Khomenko, Alexandr A.; and Filimonov, Evgeny F., 4,420,539., Cl. 428-450.000.

Tengler, John N., to A P Products Incorporated. Variable effective length cantilever contact and connector. 4,420,215., Cl. 339-176.00R.

Terachi, Junichi: *See—*
Hisatsune, Fumiyuki; Yamagata, Shinji; Terachi, Junichi; and Yoshiyasu, Hajimu, 4,420,660., Cl. 200-144.00R.

Terada, Eiichi: *See—*
Seki, Kenji; and Terada, Eiichi, 4,420,599., Cl. 526-318.000.

Terada, Katumi, to Olympus Optical Company Ltd. Shutter drive safety device for a camera. 4,420,235., Cl. 354-266.000.

Teramachi, Hiroshi. Linear ball bearing unit. 4,420,193., Cl. 308-6.00C.

Terashima, Kuniomi: *See—*
Kuroda, Yoshimi; Ito, Shichinosuke; Midorikawa, Akio; and Terashima, Kuniomi, 4,420,601., Cl. 528-76.000.

Teraube, Raoul: *See—*
Cosar, Paul; and Teraube, Raoul, 4,419,940., Cl. 110-229.000.

Terra Bella Industries: *See—*
Dewing, Kenneth M., 4,420,168., Cl. 280-43.100.

Texaco Inc.: *See—*
Darden, Jerome W.; Watts, Lewis W., Jr.; and Marquis, Edward T., 4,420,646., Cl. 585-10.000.
Dominguez, Richard J. G., 4,420,570., Cl. 521-112.000.
Hammond, Kenneth G.; Sendra, Joseph C.; Watts, Lewis W., Jr.; Marquis, Edward T.; and Larkin, John M., 4,420,647., Cl. 585-10.000.
Morduchowitz, Abraham, 4,420,598., Cl. 526-307.500.
Sanderson, John R.; Brader, Walter H., Jr.; and Watts, Lewis W., Jr., 4,420,625., Cl. 549-533.000.
Sung, Rodney L.; Zoleski, Benjamin H.; Cullen, William P.; and Kablaoui, Mahmoud S., 4,420,407., Cl. 252-33.400.
Valone, Frederick W., 4,420,414., Cl. 252-392.000.
Waddill, Harold G., 4,420,606., Cl. 528-111.000.

Texas A&M University System, The: *See—*
Lawhon, James T., 4,420,425., Cl. 260-123.500.

Texas Instruments Incorporated: *See—*
Davies, Roderick D.; and Scott, David B., 4,420,344., Cl. 148-1.500.
Scalf, Gerald W.; and Koberlein, James H., 4,420,669., Cl. 219-10.55B.
Wallace, Steven J.; and Culley, Paul L., 4,420,717., Cl. 318-696.000.

Th. Goldschmidt AG: *See—*
Huttinger, Rudolf, 4,420,410., Cl. 252-117.000.

Theisen, Peter J.: *See—*
Chen, C. Gregory; Lee, Ping S.; Theisen, Peter J.; and Krstic, Slobodan, 4,420,784., Cl. 361-7.000.

Thermo King Corporation: *See—*
Howland, Leland L., 4,419,866., Cl. 62-228.400.

Thomas, Eric R., to Molins Limited. Conveyors. 4,420,074., Cl. 198-128.000.

Thomas, Richard C.: *See—*
White, David R.; and Thomas, Richard C., 4,420,624., Cl. 549-361.000.

Thomas, Samuel G., Jr., to Ethyl Corporation. Diesel fuel composition. 4,420,311., Cl. 44-53.000.

Thomassen & Drijver-Verblifa N.V.: *See—*
Post, Willem P., 4,420,283., Cl. 413-8.000.

Thompson, William B.: *See*—
Horton, Harold O., Jr.; and Thompson, William B., 4,419,794., Cl. 24-667.000.
Thomson-CSF: *See*—
Cuel, Renaud; Le Gledic, Henri; and Le Meur, Yvon, 4,420,763., Cl. 346-139.00R.
Le Bars, Jean-Francois, 4,420,688., Cl. 250-352.000.
Tonnel, Eugene, 4,420,379., Cl. 204-38.00A.
Thomson-CSF Broadcast, Inc.: *See*—
Rahman, Atlaf, 4,420,770., Cl. 358-183.000.
Thomson, Iwar: *See*—
Hirsch, Peter; Wubbels, Bernhard; and Thomson, Iwar, 4,420,676., Cl. 219-160.000.
Thorban, Gustav, to Marabuwerke Erwin Martz GmbH & Co. Programmable braking device. 4,419,823., Cl. 33-1.00M.
Thornton, Henry M.; and Thornton, John S., to Ashcombe Products Company. Method of forming a tool assembly. 4,419,803., Cl. 29-428.000.
Thornton, John S.: *See*—
Thornton, Henry M.; and Thornton, John S., 4,419,803., Cl. 29-428.000.
Thorpe, Frank P.; and Calhoun, Leslie O., to CTS Corporation. Junction box. 4,420,090., Cl. 220-3.700.
Thorpe, Frank P.; and Calhoun, Leslie O., to CTS Corporation. Junction box. 4,420,091., Cl. 220-3.700.
Thumm, Helmut: *See*—
Peroutka, Fritz; Thumm, Helmut; Bahr, Theodor; and Stricker, Walter, 4,420,117., Cl. 241-46.170.
Thyssen Industrie AG: *See*—
Ruppert, Helmut; and Frase, Dietmar, 4,419,901., Cl. 73-862.490.
Tibbits, John L.; Springer, Lamar D.; and Sellers, John W., Jr., to Spring Valley Associates Inc. Water pump protector. 4,420,787., Cl. 361-79.000.
Tick, Paul A., to Corning Glass Works. Alkali metal zirconofluorophosphate glasses. 4,420,569., Cl. 501-30.000.
Ticker, Arthur: *See*—
Preiser, Herman S.; Ticker, Arthur; and Hatley, Kenneth J., 4,420,533., Cl. 428-351.000.
Tickle, Andrew C., to Fairchild Camera and Instrument Corporation. Method of detecting and repairing latent defects in a semiconductor dielectric layer. 4,420,497., Cl. 427-8.000.
Tielemans, Peter A. W.: *See*—
Jacobs, Cornelis A. J.; and Tielemans, Peter A. W., 4,420,708., Cl. 313-628.000.
Tischer, Friedrich-Christian; Kleinmann, Horst; and Klinger, Herwig, to Licentia Patent-Verwaltungs-GmbH. Overvoltage protection circuit for line amplifiers. 4,420,785., Cl. 361-56.000.
Toa Eiyo Ltd.: *See*—
Otsuka, Saburo; Yoshikawa, Toshiyuki; Tokuda, Shoichi; and Ito, Yuuseke, 4,420,470., Cl. 424-28.000.
Tochigi, Kenji: *See*—
Nakatani, Mitsuo; Yamazaki, Mitsuo; Okunaka, Masaaki; Sudo, Ryoichi; Tochigi, Kenji; and Yokono, Hitoshi, 4,420,500., Cl. 427-54.100.
Todd, Albert A., to RCA Corporation. Testing semiconductor furnaces for heavy metal contamination. 4,420,722., Cl. 324-158.00R.
Tohata, Toru, to Nissan Motor Co., Ltd. Rear lamp construction of a hatchback type motor vehicle. 4,420,797., Cl. 362-80.000.
Toho Belson Co., Ltd.: *See*—
Ogawa, Hiroyasu; and Shima, Mikio, 4,420,512., Cl. 427-386.000.
Tohoku Metal Industries, Ltd.: *See*—
Nishino, Hisao, 4,420,804., Cl. 363-21.000.
Tohyama, Shunroku: *See*—
Masuda, Yutaka; Takai, Toshiaki; and Tohyama, Shunroku, 4,420,522., Cl. 428-95.000.
Tokai Chemical Industries, Ltd.: *See*—
Nakashima, Akira, 4,420,447., Cl. 264-46.400.
Tokico, Ltd.: *See*—
Ito, Yoshimasa; Hashizume, Junji; Ikeda, Junichi; Utsumi, Noriyuki; and Naka, Tessyu, 4,420,812., Cl. 364-513.000.
Toko Kabushiki Kaisha: *See*—
Takahashi, Toshihiro, 4,420,664., Cl. 200-308.000.
Tokuda, Fuminori, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,420,531., Cl. 428-329.000.
Tokuda, Hiroshi: *See*—
Okazaki, Yutaka; Tokuda, Hiroshi; Miyahara, Shiyoichiro; and Yamada, Yoshitsugu, 4,420,481., Cl. 424-250.000.
Tokuda, Shoichi: *See*—
Otsuka, Saburo; Yoshikawa, Toshiyuki; Tokuda, Shoichi; and Ito, Yuuseke, 4,420,470., Cl. 424-28.000.
Tokudome, Katsumi: *See*—
Hattori, Shuzo; Kamide, Noboru; Tokudome, Katsumi; Ishikawa, Michio; and Hayashi, Yuji, 4,420,835., Cl. 372-88.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hirose, Masahiko; Yasui, Tsuyoshi; Ochi, Yoshiharu; and Nakagawa, Masatoshi, 4,420,498., Cl. 427-39.000.
Iwai, Hiroshi, 4,419,813., Cl. 29-576.00W.
Nakamura, Kiyoshi; Nishida, Katsutoshi; Ochiai, Toshihiko; Ando, Akio; and Okada, Syoji, 4,419,971., Cl. 123-193.00C.
Oka, Koichiro; Tanaka, Hiroshi; and Harigae, Makoto, 4,420,366., Cl. 156-644.000.
Wada, Ichiro, 4,419,899., Cl. 73-861.120.
Yamaura, Mitsuru; Kondow, Ryotaro; and Inagaki, Junichi, 4,420,805., Cl. 364-184.000.
Tolkmitt, Uwe: *See*—
Fiedler, Gerhard; Fritzsche, Werner; Herold, Frank; and Tolkmitt, Uwe, 4,420,697., Cl. 307-308.000.
Tomikawa, Ryoichi: *See*—
Yamamoto, Yasunobu; Tomikawa, Ryoichi; and Ishii, Masami, 4,420,067., Cl. 188-251.00A.
Tomizawa, Yoshio: *See*—
Motoyama, Kazuyasu; Nakao, Toshihiro; Nasu, Mitsuo; and Tomizawa, Yoshio, 4,420,216., Cl. 339-183.000.
Toney, John J., to Motorola, Inc. Polarity guard circuit. 4,420,786., Cl. 361-77.000.
Tonnel, Eugene, to Thomson-CSF. Method for the formation of polycrystalline silicon layers, and its application in the manufacture of a self-aligned, non planar, MOS transistor. 4,420,379., Cl. 204-38.00A.
Topich, James A., to NCR Corporation. Method of fabricating an integrated circuit voltage multiplier containing a parallel plate capacitor. 4,419,812., Cl. 29-571.000.
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Masuda, Yutaka; Takai, Toshiaki; and Tohyama, Shunroku, 4,420,522., Cl. 428-95.000.
Toray Silicone Company, Ltd.: *See*—
Fukano, Yoshimasa; and Yoshizawa, Minoru, 4,420,409., Cl. 252-78.300.
Tovarny strojirenske techniky, koncern: *See*—
Spacek, Jindrich; Smrcek, Vaclav; Voda, Karel; Kosek, Jiri; Hrdina, Jan; and Penaz, Vaclav, 4,419,876., Cl. 72-57.000.
Townsend, Robert L.: *See*—
Maynard, Robert L.; Ballard, Samuel S.; and Townsend, Robert L., 4,420,825., Cl. 367-122.000.
Toyo Jozo Company, Ltd.: *See*—
Ikuta, Shigeru; Matsuura, Kazuo; and Misaki, Hideo, 4,420,562., Cl. 435-227.000.
Toyo Kogyo Co., Ltd.: *See*—
Shibukawa, Takao, 4,419,935., Cl. 102-313.000.
Yamashita, Hajime; and Takenaka, Michio, 4,419,801., Cl. 29-156.4WL.
Toyo Seikan Kaisha, Limited: *See*—
Kawaguchi, Kiyoshi; Yamada, Muneki; Kato, Nobuyuki; Kanou, Fumio; Sakamoto, Akira; and Mitsuhashi, Minoru, 4,420,454., Cl. 264-512.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Fukuda, Mitsutoshi; Baba, Nobuyuki; and Arichika, Kenji, 4,420,257., Cl. 356-341.000.
Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; and Miyaji, Akira, to Nippon Kogaku K.K. Electronic photographic camera. 4,420,773., Cl. 358-335.000.
Toyoda, Takashi; Obba, Yozo; Yamanaka, Masaaki; and Shirai, Kanji, to Oji Yuka Goseishi Kabushiki Kaisha. Coating agents and thermoplastic resin films coated therewith. 4,420,530., Cl. 428-323.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ando, Takayuki, 4,420,126. Cl. 242-107.200.
Hattori, Tadashi; Yoshida, Hitoshi; Akutagawa, Keichi; Takata, Akira; and Fukuda, Tamotsu, 4,419,972., Cl. 123-337.000.
Kojima, Ikuzo, 4,420,172., Cl. 280-802.000.
Kondo, Katsumi; Fuwa, Yoshio; Harayama, Akira; and Nakahora, Toru, 4,420,543., Cl. 428-564.000.
Matsushima, Katsuaki; and Uchida, Goro, 4,420,115., Cl. 237-12.30A.
Moriya, Shigeru; Yosida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Katsuno, Mitsuaki, 4,420,173., Cl. 280-804.000.
Nagase, Masaomi; Ono, Hironobu; Nakano, Jiro; and Miyagi, Hideo, 4,419,974., Cl. 123-418.000.
Tsuzuki, Yoshihiko; Uchida, Kiyoshi; and Tanahashi, Toshio, 4,419,925., Cl. 92-212.000.
Treffinger, Karl; and Reimold, Gunther, to E.G.O. Elektro-Gerate Blanc u. Fischer. Switching and control device. 4,420,072., Cl. 192-139.000.
Trick, Robert E., to Medical Engineering Corporation. Apparatus for reversibly closing a body passage. 4,419,985., Cl. 128-1.00R.
Triumph-Adler A.G. fur Buro- und Informationstechnik: *See*—
Ackermann, Rolf; Jung, Friedrich; Mauer, Egon; and Rupertinger, Hermann, 4,420,269., Cl. 400-356.000.
Troy, Michael K.: *See*—
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Trump, Dennis H., to Nashua Control Instruments, Inc. Image reproportioning machine. 4,420,249., Cl. 355-84.000.
TRW Inc.: *See*—
Drutchas, Gilbert H., 4,420,290., Cl. 417-283.000.
Hamada, Shinobu J.; and Yodokawa, Taro, 4,420,756., Cl. 343-16.00M.
Tsang, Paul J.: *See*—
Riseman, Jacob; and Tsang, Paul J., 4,419,809., Cl. 29-571.000.
Tsuboi, Masatake; Hirono, Hatsuo; and Aikawa, Kazuo, to Yoshida Kogyo K. K. Method for forming decorative colored streak patterns on the surface of an aluminum shaped article. 4,420,378., Cl. 204-35.00N.
Tsuchitani, Takashi: *See*—
Suezawa, Takahiko; Koizumi, Satoru; Nakao, Hiroaki; and Tsuchitani, Takashi, 4,420,783., Cl. 360-137.000.
Tsuji, Nobuhiko; Nakamura, Keijiroh; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, to Fuji Electric Company, Ltd. Blood sugar analyzer having fixed enzyme membrane sensor. 4,420,564., Cl. 435-288.000.

Tsukamura, Yoshihiro; Aizawa, Hidekuni; and Ohta, Keiichi, to Sony Corporation. Printing apparatus and tape clamp therefor. 4,420,268., Cl. 400-233.000.
Tsutomu, Nozaki: *See*—
Yoshiei, Kato; Kyoji, Nakanishi; and Tsutomu, Nozaki, 4,420,334., Cl. 75-60.000.
Tsuzuki, Yoshihiko; Uchida, Kiyoshi; and Tanahashi, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Assembled piston for engine. 4,419,925., Cl. 92-212.000.
Tuchiya, Yoshifumi. Cutting tool driving apparatus for a lathe. 4,419,799., Cl. 29-37.00A.
Tufts, Wesley M., to Control Fluidics, Inc. Filter module. 4,420,403., Cl. 210-787.000.
Tunstall, Karl N., to Otis Engineering Corporation. Method for cutting and replacing tubing without killing well. 4,420,042., Cl. 166-297.000.
Tunturipyora Oy: *See*—
Kotamaki, Esko, 4,419,890., Cl. 73-379.000.
Tutt, Timothy T.: *See*—
Barlow, Gordon A.; Tutt, Timothy T.; Karlin, Richard A.; and Krutsch, John R., 4,420,261., Cl. 356-375.000.
Tyler, Derek E.: *See*—
Pryor, Michael J.; and Tyler, Derek E., 4,420,030., Cl. 164-472.000.
Tyszkiewicz, Theodore J.: *See*—
Boden, Richard M.; and Tyszkiewicz, Theodore J., 4,420,411., Cl. 252-174.110.
Boden, Richard M.; Vock, Manfred H.; and Tyszkiewicz, Theodore J., 4,420,472., Cl. 424-58.000.
Ube Industries, Ltd.: *See*—
Furusaki, Shinichi; Manada, Noriaki; Yamashina, Hisao; and Matsuda, Masaoki, 4,420,633., Cl. 560-232.000.
Ueno, Haruo; Yano, Takefumi; Shimizu, Michimasa; Tamura, Masanori; and Yuasa, Sakae, 4,420,594., Cl. 526-128.000.
Uchida, Goro: *See*—
Matsushima, Katsuaki; and Uchida, Goro, 4,420,115., Cl. 237-12.30A.
Uchida, Kiyoshi: *See*—
Tsuzuki, Yoshihiko; Uchida, Kiyoshi; and Tanahashi, Toshio, 4,419,925., Cl. 92-212.000.
Uchida, Yoko: *See*—
Yamada, Hiromichi; Suzuki, Atsushi; Oba, Yoichi; Uchida, Yoko; Kohno, Hideki; Fukino, Tadashi; and Yoshida, Minoru, 4,420,444., Cl. 264-21.000.
Ueda, Jitsuhiko: *See*—
Takagi, Tomio; Ueda, Jitsuhiko; Fujii, Tadaomi; and Tanaka, Kazuhiko, 4,420,335., Cl. 75-124.000.
Ueda, Kazuo; Horio, Yoshio; Kanno, Toshiyuki; and Abe, Yoshio, to Central Glass Company, Limited. Method of forming colored or conductive coating layer on glass sheet. 4,420,501., Cl. 427-54.100.
Ueda, Masanori; Sumitomo, Hidehiko; and Yoshimura, Hirofumi, to Nippon Steel Corporation. Process for producing an austenitic stainless steel sheet or strip. 4,420,347., Cl. 148-12.00E.
Uemura, Nobuo: *See*—
Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dentaro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332., Cl. 75-26.000.
Ueno, Haruo; Yano, Takefumi; Shimizu, Michimasa; Tamura, Masanori; and Yuasa, Sakae, to UBE Industries, Ltd. Method for polymerizing ethylene. 4,420,594., Cl. 526-128.000.
Ueno, Ichiro: *See*—
Wada, Yoshiyo; Kinjo, Hisao; and Ueno, Ichiro, 4,420,827., Cl. 369-43.000.
Uhl, George A.: *See*—
Baillie, Lloyd A.; and Uhl, George A., 4,419,893., Cl. 73-439.000.
Uhrhan, Paul; Krauthausen, Edmund; Stahlke, Kurt-Rainer; Quaas, Gerwolf; and Ruetz, Lothar, to Bayer Aktiengesellschaft. Dihydrobenzothiazine compounds and the preparation thereof. 4,420,613., Cl. 544-51.000.
Uhrig, Heinz: *See*—
Opitz, Konrad; Grossmann, Max; Kruse, Hurbert; Schneider, Manfred; and Uhrig, Heinz, 4,420,310., Cl. 8-560.000.
Uibel, Paul-Ulrich: *See*—
Sobczyk, Erhard; and Uibel, Paul-Ulrich, 4,419,782., Cl. 15-339.000.
Ukawa, Naohiko: *See*—
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; Oshima, Michio; Okino, Susumu; and Shigeta, Sadaichi, 4,420,465., Cl. 423-242.000.
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; and Ishii, Kiyoto, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Antibiotic, MF266 substance and production thereof. 4,420,473., Cl. 424-118.000.
Umezawa, Michio, to Ricoh Company, Ltd. Apparatus and method for separating a single sheet from a stack and conveying it. 4,420,150., Cl. 271-11.000.
Union Carbide Corporation: *See*—
Blickensderfer, John R.; and Pacala, Luba A., 4,420,571., Cl. 523-149.000.
Union Special Corporation: *See*—
Goodman, Thomas P.; Yin, Chieh-Kung; and Kosrow, Robert L., 4,419,949., Cl. 112-262.100.
Union Special G.m.b.H.: *See*—
von Hagen, Wolf R., 4,419,948., Cl. 112-256.000.
Uniroyal, Inc.: *See*—
Bell, Allyn R., 4,420,326., Cl. 71-93.000.
United States Gypsum Company: *See*—
Failmezger, Friedrich; and Lat, Geronimo E., 4,419,853., Cl. 52-741.000.
United States of America
Agriculture: *See*—
Eaton, David C.; Kirk, Thomas K.; and Chang, Hou-min, 4,420,369., Cl. 162-29.000.
Air Force: *See*—
Primbs, Robert J., Jr., 4,420,755., Cl. 340-870.380.
Wiley, Walter H., III; and Gunn, John A., 4,420,834., Cl. 372-35.000.
Wise, Joseph F.; and Holt, James F., 4,420,650., Cl. 136-255.000.
Army: *See*—
Coates, Arthur D.; Donovan, William F.; Rakaczky, John A.; and Scott, Wayman E., 4,419,936., Cl. 102-364.000.
DeWilde, Mark A.; and Beyer, Richard A., 4,420,255., Cl. 356-315.000.
Fox, David S.; and Cawelti, Donald G., 4,420,123., Cl. 242-147.00R.
Gentiluomo, Joseph A., 4,419,881., Cl. 73-37.000.
Gerharz, Reinhold, 4,420,217., Cl. 350-362.000.
Huber, William A., 4,420,682., Cl. 235-472.000.
National Aeronautics and Space Administration: *See*—
Harper, Lawrence L., 4,420,836., Cl. 372-98.000.
Hewitt, Dennis R., 4,420,035., Cl. 165-32.000.
Progar, Donald J., 4,420,518., Cl. 428-40.000.
Schroeder, James E.; and Shlichta, Paul J., 4,420,352., Cl. 156-89.000.
Navy: *See*—
Burns, William K.; and Rashleigh, Scott C., 4,420,258., Cl. 356-350.000.
Camp, Albert T.; and Csanady, Elmer R., 4,420,350., Cl. 149-98.000.
Taylor, Henry F., 4,420,259., Cl. 356-350.000.
U.S. Philips Corporation: *See*—
Bower, David E., 4,420,728., Cl. 333-151.000.
de Jager, Frank, 4,420,723., Cl. 330-10.000.
Jacobs, Cornelis A. J.; and Tielemans, Peter A. W., 4,420,708., Cl. 313-628.000.
Meyer-Ebrecht, Dietrich, 4,420,753., Cl. 340-870.260.
Mixner, Ingomar, 4,420,702., Cl. 310-50.000.
Nelissen, Johann W. A.; Ponnee, Johannes J.; Legierse, Petrus E. J.; and Van Ruler, Johannes, 4,420,506., Cl. 427-162.000.
Ortega, Francis, 4,420,338., Cl. 106-20.000.
Raadsen, Johannes F. A., 4,420,698., Cl. 307-351.000.
United Technologies Corporation: *See*—
Diamond, Edmond D.; Maciolek, Joseph R.; and Kingston, Leo, 4,420,808., Cl. 364-434.000.
Dvorak, Herman G.; Klapatch, Robert D.; Russell, Sid; and Spadaccini, Louis J., 4,419,863., Cl. 60-748.000.
Kos, Joseph M.; Patrick, John P.; and Harner, Kermit I., 4,420,692., Cl. 290-44.000.
Universal Foods Corporation: *See*—
Chen, Shao L.; and Gutmanis, Feliks, 4,420,563., Cl. 435-245.000.
University of Maryland: *See*—
Taylor, Leonard S., 4,420,492., Cl. 426-241.000.
University Patents, Inc.: *See*—
McIntire, William R., 4,419,984., Cl. 126-439.000.
UOP Inc.: *See*—
Antos, George J., 4,420,649., Cl. 585-434.000.
Upadhyayula, Lakshminarasimha C., to RCA Corporation. Voltage comparator using unequal gate width FET's. 4,420,743., Cl. 340-347.0AD.
Upjohn Company, The: *See*—
Aristoff, Paul A., 4,420,632., Cl. 560-119.000.
Bonk, Henry W.; Nelb, Robert G., II; and Oertel, Richard W., III, 4,420,602., Cl. 528-80.000.
Nelb, Robert G., II; and Oertel, Richard W., III, 4,420,603., Cl. 528-80.000.
White, David R., 4,420,623., Cl. 549-361.000.
White, David R.; and Thomas, Richard C., 4,420,624., Cl. 549-361.000.
Uramoto, Makoto: *See*—
Fujiwara, Michiaki; and Uramoto, Makoto, 4,419,861., Cl. 57-261.000.
Uschold, Ronald E., to Du Pont de Nemours, E. I., and Company. Fluorinated ether-ketones. 4,420,638., Cl. 568-415.000.
Ushinohama, Kazuyuki: *See*—
Jikihara, Tetsuo; Oda, Masatsugu; Ushinohama, Kazuyuki; Watanabe, Hisao; and Suzuki, Seiichi, 4,420,327., Cl. 71-96.000.
USM Corporation: *See*—
Remon, Francis O., 4,420,297., Cl. 425-577.000.
Utsch, Francis V.: *See*—
Washington, James M.; Fillenwarth, Dale R.; and Utsch, Francis V., 4,420,635., Cl. 562-555.000.
Utsumi, Noriyuki: *See*—
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Uwai, Toshihiro: *See*—
Sato, Akihiro; Kikuta, Kazutsune; Matsuda, Kenji; Uwai, Toshihiro; and Hanari, Tohru, 4,420,593., Cl. 526-128.000.
Vaidyanathan, Kumbakonam R., to Monsanto Company. Process for the nitration of halobenzenes. 4,420,645., Cl. 568-937.000.
Vales, Jean-Pierre: *See*—
Salle, Jacques E.; Jossif, Jean A. M.; Rathier, Gilbert J. M.; and Vales, Jean-Pierre, 4,420,832., Cl. 370-56.000.

Valimont, James L.; and Shadle, Barry L., to PPG Industries, Inc. Apparatus for aligning bent glass sheets for assembly into bent glass sheet sandwiches. 4,420,361., Cl. 156-556.000.

Valimont, James L.; and Phares, Hershel L., to PPG Industries, Inc. Shaped mold and a method of using same to assemble sandwich of a sheet of flexible interlayer material with bent glass sheets. 4,420,362., Cl. 156-563.000.

Valone, Frederick W., to Texaco Inc. Corrosion inhibition system. 4,420,414., Cl. 252-392.000.

Van Besauw, Jan F.; Leenders, Luc H.; D'hont, Dirk M.; Kokelenberg, Hendrik E.; and Samijn, Rafael P., to AGFA-GEVAERT N.V. Photosensitive recording material and photographic processes wherein said material is used. 4,420,553., Cl. 430-275.000.

van Dalen, Hendrik; and Schlosser, Willem, to Stamicarbon B.V. Process and device for injection-molding plastics. 4,420,452., Cl. 264-328.800.

van de Moesdijk, Cornelis; and Janssen, Petrus H. J., to Stamicarbon B.V. Process for the preparation of a 5-alkyl-butyrolacetone. 4,420,622., Cl. 549-326.000.

Vandenberg, Andrew W.: *See*—
Vandenberg, August; Vandenberg, Ben W.; Vandenberg, Andrew W.; and Haws, Ben E., 4,419,961., Cl. 119-14.030.

Vandenberg, August; Vandenberg, Ben W.; Vandenberg, Andrew W.; and Haws, Ben E. Milking parlor construction. 4,419,961., Cl. 119-14.030.

Vandenberg, Ben W.: *See*—
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Vandenbossche, Jean-Jacques: *See*—
Bugaut, Andree; and Vandenbossche, Jean-Jacques, 4,420,637., Cl. 564-443.000.

VanderVaart, Gerry, to Kool-Fire Limited. Heat-augmented heat exchanger. 4,420,034., Cl. 165-29.000.

Van Horn, David D., to General Electric Company. Reflector lamp with shaped reflector and lens. 4,420,800., Cl. 362-297.000.

Van Horn, David D.: *See*—
Reiling, Gilbert H.; Putz, John M.; and Van Horn, David D., 4,420,801., Cl. 362-297.000.

Van Koppen, Christianus W. J.; Rademaker, Onno; and De Ron, Adriaan J., to Eurometaal N.V. Method of controlling the energy management of an energy system and energy system based on said method. 4,420,032., Cl. 165-1.000.

Van Loveren, Augustinus G.: *See*—
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,420,423., Cl. 252-522.00R.

Van Ruler, Johannes: *See*—
Nelissen, Johann W. A.; Ponnee, Johannes J.; Legierse, Petrus E. J.; and Van Ruler, Johannes, 4,420,506., Cl. 427-162.000.

Vansteelant, Marc G.: *See*—
Munro, James A.; and Vansteelant, Marc G., 4,420,177., Cl. 289-14.000.

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VanValkenburg, Howard E., to Automation Industries, Inc. Backing for ultrasonic transducer crystal. 4,420,707., Cl. 310-327.000.

Varma, Ravi K., to E. R. Squibb & Sons, Inc. 16-Ketoandrostene-17-dithioketals. 4,420,428., Cl. 260-397.450.

Vasilieva, Ljudmila V.: *See*—
Rubanov, Alexandr S.; Tanin, Leonid V.; Vasilieva, Ljudmila V.; Kalinin, Anatoly N.; Bursky, Vyacheslav A.; and Vidmant, Felix V., 4,420,218., Cl. 350-3.850.

Vaughn, Julian E.: *See*—
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VDO Adolf Schindling AG: *See*—
Collonia, Harald, 4,419,973., Cl. 123-396.000.

VEB Kombinat Wolle und Seide: *See*—
Fiedler, Gerhard; Fritzsche, Werner; Herold, Frank; and Tolkmitt, Uwe, 4,420,697., Cl. 307-308.000.

Verburgh, Martin B.: *See*—
Kapaan, Hendrikus J.; and Verburgh, Martin B., 4,419,816., Cl. 29-724.000.

Verkevich, Vsevolod I.: *See*—
Belov, Valentin V.; and Verkevich, Vsevolod I., 4,420,139., Cl. 251-28.000.

Vermaat, David L.: *See*—
Baker, James M.; and Vermaat, David L., 4,420,243., Cl. 355-3.0TR.

Vibrachoc: *See*—
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Victor Company of Japan, Limited: *See*—
Takahashi, Soichi; and Kobayashi, Susumu, 4,420,711., Cl. 315-296.000.
Takehara, Hideaki, 4,420,675., Cl. 219-121.0LM.
Wada, Yoshiyo; Kinjo, Hisao; and Ueno, Ichiro, 4,420,827., Cl. 369-43.000.

Vidmant, Felix V.: *See*—
Rubanov, Alexandr S.; Tanin, Leonid V.; Vasilieva, Ljudmila V.; Kalinin, Anatoly N.; Bursky, Vyacheslav A.; and Vidmant, Felix V., 4,420,218., Cl. 350-3.850.

Vilter Manufacturing Company: *See*—
Szymaszek, Paul G., 4,419,865., Cl. 62-193.000.

Vis, Arthur D.; and Sarafian, Karl, to Craft Line Inc. Cable connector. 4,420,199., Cl. 339-8.00R.

Vital Kogyo Kabushiki Kaisha: *See*—
Nishimura, Koji, 4,420,144., Cl. 254-345.000.

Vock, Manfred H.: *See*—
Boden, Richard M.; Vock, Manfred H.; and Tyszkiewicz, Theodore J., 4,420,472., Cl. 424-58.000.

Voda, Karel: *See*—
Spacek, Jindrich; Smrcek, Vaclav; Voda, Karel; Kosek, Jiri; Hrdina, Jan; and Penaz, Vaclav, 4,419,876., Cl. 72-57.000.

Voges, Wolfgang, to Claus Koenig K.G. Adhesive coating apparatus for coating sheet-like materials. 4,419,957., Cl. 118-245.000.

Vogt, Wilhelm, to Hans Kaufeld GmbH & Co. Convertible low-back, high-back upholstered furniture. 4,420,186., Cl. 297-284.000.

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Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860., Cl. 57-22.000.
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Watanabe, Kazuhiro: *See*—
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Watanabe, Yoshio; and Iijima, Nobuo, to Fujitsu Limited. Optical apparatus having a mirror. 4,420,223., Cl. 350-310.000.

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Schiebold, Cristopher F.; and Green, William R., 4,420,731., Cl. 333-219.000.

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Lee, Quarterman; Watson, Larry E.; and Montgomery, Glenn E., 4,420,003., Cl. 134-80.000.

Watt, John C.: *See*—
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Sanderson, John R.; Brader, Walter H., Jr.; and Watts, Lewis W., Jr., 4,420,625., Cl. 549-533.000.

Watts, Robert C.: *See*—
Sharp, Derek J.; and Watts, Robert C., 4,420,009., Cl. 137-98.000.

Webasto-Werk W. Baier GmbH & Co.: *See*—
Bienert, Horst; and Pfisterer, Hermann, 4,420,185., Cl. 296-223.000.

Weber, Joseph H.: *See*—
DeClark, Bruce W.; and Weber, Joseph H., 4,419,875., Cl. 72-53.000.

Weber, Raimund: *See*—
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Weber, Ronald G., to Lowrance Electronics, Inc. Sonar apparatus having improved gain control. 4,420,824., Cl. 367-98.000.

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Apotheloz, Robert, 4,419,934., Cl. 102-233.000.

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Meadows, Clayton D., 4,420,148., Cl. 270-41.000.

West, Donald O. Trim tab position monitor and display device. 4,420,741., Cl. 340-29.000.

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Martinez, Manuel; and Zelins, Ronald P., 4,420,125., Cl. 242-77.000.
Martyniak, Gerald J., 4,420,206., Cl. 339-75.00M.

Westgate, Bernard C., Jr.: *See*—
Petersen, Christian C.; and Westgate, Bernard C., Jr., 4,420,714., Cl. 318-135.000.

Westhead, William T., to Scapa Dryers, Inc. Anti-static dryer fabrics. 4,420,529., Cl. 428-244.000.

Westinghouse Electric Corp.: *See*—
Dudash, Allan A., 4,420,841., Cl. 455-607.000.

Westland Aircraft Limited: *See*—
Middleton, Martin J., 4,420,131., Cl. 244-115.000.

Weyerhaeuser Company: *See*—
Kunkel, Arden L.; and Pierson, Darrell E., 4,420,510., Cl. 427-208.200.

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Briehl, Gerhard, 4,419,906., Cl. 74-413.000.

Whelan, Elizabeth M. Jewelry holding device. 4,420,084., Cl. 206-566.000.

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Brenner, Robert A., 4,419,870., Cl. 68-18.0FA.

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White, Patricia M.: *See*—
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Marshall, William J., Jr.; and White, Ronald P., 4,420,826., Cl. 367-167.000.

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Efinger, Arnold; and Moser, Erwin, 4,420,661., Cl. 200-144.00B.

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Hanson, James M.; and Schlichting, Robert, 4,420,286., Cl. 414-539.000.

Widiger, Gary N., to Polaroid Corporation. Hydrazine dyes. 4,420,627., Cl. 549-394.000.

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Wikel, James H.: *See*—
Morwick, Tina M.; Paget, Charles J.; and Wikel, James H., 4,420,479., Cl. 424-246.000.

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Douglass, Donald C., 4,420,103., Cl. 224-210.000.

Wiley, Walter H., III; and Gunn, John A., to United States of America, Air Force. Flow attenuator for use with liquid cooled laser mirrors. 4,420,834., Cl. 372-35.000.

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Wilms, Gunter: *See*—
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860., Cl. 57-22.000.

Wilshire, Colin; and Jongen, Rene, to ICI Australia Limited. Cyanophenoxybenzyl amines. 4,420,614., Cl. 544-163.000.

Wilson, Douglas: *See*—
Fogg, Sidney G.; Robertson, Frank C.; and Wilson, Douglas, 4,420,573., Cl. 523-333.000.

Wilson, Earl D.; and Holmes, Martin J., to Kendall Company, The. Stand up organizer. 4,420,085., Cl. 206-571.000.

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Wilson, John C.: *See*—
Yacobucci, Paul D.; and Wilson, John C., 4,420,630., Cl. 560-104.000.

Wilson, Joseph F., to Phillips Petroleum Company. Process for removal of carbon black floc associated with wet-process phosphoric acid in the production of fertilizers. 4,420,321., Cl. 71-43.000.

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Winkler, Theodore; and Reed, Frank J., to Brandt, Inc. Document handling counting and examining device incorporating high speed rotary gating means. 4,420,153., Cl. 271-304.000.

Winstead, Thomas W., to Maryland Cup Corporation. Dynamic cooler apparatus for molten thermoplastic material. 4,420,291., Cl. 417-338.000.

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Witco Chemical Corporation: *See*—
Epstein, Peter F.; Peveler, Richard D.; and Fisch, Michael H., 4,420,437., Cl. 260-969.000.

Wodecki, Jozef: *See*—
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Wolff Walsrode Aktiengesellschaft: *See*—
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Wolters, Martin: *See*—
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Wondra, Arthur: *See*—
Reis, Edmund; and Wondra, Arthur, 4,420,209., Cl. 339-91.00R.

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Wong, Louis F., to Procter & Gamble Company, The. Activation of hypochlorite bleaching of dyes. 4,420,412., Cl. 252-186.380.
Wood, Edward T., to Completion Tool Company. Packer valve arrangement. 4,420,159., Cl. 277-34.000.
Wood Manufacturing Co., Inc.: *See*—
Stone, Wayne B., Jr., 4,419,927., Cl. 99-275.000.
Wortman, Alex: *See*—
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Wright, A. Nelson: *See*—
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Wright, Bruce R., to Associated Equipment Corporation. Polarity indicating battery booster cable assembly. 4,420,212., Cl. 339-113.00L.
Wright, Randall J. Composite level construction. 4,419,833., Cl. 33-379.000.
Wu, Jeng-Shyong. Electrical plug and socket having replaceable over-current-protection device provided with safety latch means. 4,420,214., Cl. 339-147.00P.
Wu, Tsun Z. Component framework structure for the frame of a foldable umbrella. 4,420,007., Cl. 135-25.00R.
Wubbels, Bernhard: *See*—
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Wuerzer, Bruno: *See*—
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Wussow, George: *See*—
Lee, Lester H.; and Wussow, George, 4,420,818., Cl. 364-900.000.
Wysocki, Thomas J., to General Motors Corporation. Camber adjustment tool and method for strut type vehicle suspension. 4,420,170., Cl. 280-661.000.
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Yamada, Hiromichi; Suzuki, Atsushi; Oba, Yoichi; Uchida, Yoko; Kohno, Hideki; Fukino, Tadashi; and Yoshida, Minoru, to Hitachi, Ltd.; and Hitachi Medical Corporation. Process for forming phosphor powder layer. 4,420,444., Cl. 264-21.000.
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Yamada, Yoshitsugu: *See*—
Okazaki, Yutaka; Tokuda, Hiroshi; Miyahara, Shiyoichiro; and Yamada, Yoshitsugu, 4,420,481., Cl. 424-250.000.
Yamagata, Shinji: *See*—
Hisatsune, Fumiyuki; Yamagata, Shinji; Terachi, Junichi; and Yoshiyasu, Hajimu, 4,420,660., Cl. 200-144.00R.
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Yamaichi Electric Mfg. Co., Ltd.: *See*—
Nishikawa, Kinichi, 4,420,207., Cl. 339-75.00M.
Yamamoto Kagaku Gosei Co., Ltd.: *See*—
Ikegami, Seishi; and Hatano, Yoshihiro, 4,420,616., Cl. 546-5.000.
Yamamoto, Kiyokazu; Hiratsuka, Ko; Tanaka, Toshie; and Iwasaki, Shigeyuki, to Nifco Inc.; and Jidosha Denki Kogyo Kabushiki Kaisha. Filter device for fuel tank. 4,420,396., Cl. 210-416.400.
Yamamoto, Ryoichi: *See*—
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Yamamoto, Yasunobu; Tomikawa, Ryoichi; and Ishii, Masami, to Aisin Seiki Kabushiki Kaisha; and Aisin Kako Kabushiki Kaisha. Friction member of resin mold type. 4,420,067., Cl. 188-251.00A.
Yamanaka, Masaaki: *See*—
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Yamashita, Hajime; and Takenaka, Michio, to Toyo Kogyo Co., Ltd. Method for manufacturing a cast iron cylinder block. 4,419,801., Cl. 29-156.4WL.
Yamashita, Keitaro, to Hitachi Metals, Ltd. Magnetic brush developing and cleaning process. 4,420,242., Cl. 355-3.0DD.
Yamashita, Yoshisato; Inoue, Masanobu; and Fukatsu, Kohichi, to Chisso Corporation. Method of treating converted potassium sulfate for reducing a small amount of chlorine contained therein. 4,420,468., Cl. 423-482.000.
Yamaura, Mitsuru; Kondow, Ryotaro; and Inagaki, Junichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Protective relaying system. 4,420,805., Cl. 364-184.000.
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Yamazaki, Shigeru; Arai, Takao; Kobayashi, Masaharu; Hoshino, Takashi; Hibino, Chitoshi; and Kobari, Harukuni, to Nippon Victor Kabushiki Kaisha; and Hitachi, Ltd. Circuit and method for protecting a horizontal synchronous signal. 4,420,775., Cl. 360-38.100.
Yamazaki, Shigetomo: *See*—
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Yamazaki, Takeo: *See*—
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Yanagida, Yoshinobu: *See*—
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Yasuyuki, Haneishi; and Komoto, Shinsuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exchange mount with data transmitting electrical contacts. 4,420,239., Cl. 354-286.000.
Yates, Vincent A.: *See*—
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Yin, Chieh-Kung: *See*—
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Yodokawa, Taro: *See*—
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Yokoi, Fumio: *See*—
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Yokomichi, Isao; Haga, Takahiro; Nasu, Rikuo; Nagatani, Kuniaki; and Nakajima, Toshio, to Ishihara Sangyo Kaisha Ltd. Process for producing 5-chloro-β-trifluoromethylpyridines. 4,420,618., Cl. 546-345.000.
Yokono, Hitoshi: *See*—
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Yoshida, Hitoshi: *See*—
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Yoshida Kogyo K. K.: *See*—
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Yoshida Kogyo K.K.: *See*—
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Yoshida, Kunio, to Sharp Kabushiki Kaisha. Electronic word retrieval device for searching and displaying one of different forms of a word entered. 4,420,816., Cl. 364-900.000.
Yoshida, Kunio, to Sharp Kabushiki Kaisha. Word endings inflection means for use with electronic translation device. 4,420,817., Cl. 364-900.000.
Yoshida, Minoru: *See*—
Yamada, Hiromichi; Suzuki, Atsushi; Oba, Yoichi; Uchida, Yoko; Kohno, Hideki; Fukino, Tadashi; and Yoshida, Minoru, 4,420,444., Cl. 264-21.000.
Yoshida, Tomio; Nagashima, Michiyoshi; Harigae, Shunji; Ichinose, Makoto; and Wakami, Noboru, to Matsushita Electric Industrial Co., Ltd. Optical recording and/or reproducing device. 4,420,828., Cl. 369-47.000.
Yoshiei, Kato; Kyoji, Nakanishi; and Tsutomu, Nozaki, to Kawasaki Steel Corporation. Method for controlling the bottom-blowing gas in top-and-bottom blown converter steel making. 4,420,334., Cl. 75-60.000.
Yoshikawa, Kensei: *See*—
Amano, Takehiro; Ogawa, Toshihisa; Yoshikawa, Kensei; Shiobara, Yoshinori; Sano, Tatsuhiko; Ohuchi, Yutaka; Tanami, Tohru; Ito, Shoichi; and Sawada, Jiro, 4,420,631., Cl. 560-104.000.
Yoshikawa, Toshiyuki: *See*—
Otsuka, Saburo; Yoshikawa, Toshiyuki; Tokuda, Shoichi; and Ito, Yuuseke, 4,420,470., Cl. 424-28.000.

Yoshimura, Hirofumi: *See*—
Ueda, Masanori; Sumitomo, Hidehiko; and Yoshimura, Hirofumi, 4,420,347., Cl. 148-12.00E.

Yoshimura, Noriaki: *See*—
Matsumoto, Mitsuo; Yoshimura, Noriaki; and Tamura, Masuhiko, 4,420,640., Cl. 568-454.000.

Yoshioka, Yoshihiro; and Harima, Hiroshi, to Kuraray Company Limited. Water-absorbing rubber composition. 4,420,588., Cl. 525-93.000.

Yoshiyasu, Hajimu: *See*—
Hisatsune, Fumiyuki; Yamagata, Shinji; Terachi, Junichi; and Yoshiyasu, Hajimu, 4,420,660., Cl. 200-144.00R.

Yoshizawa, Minoru: *See*—
Fukano, Yoshimasa; and Yoshizawa, Minoru, 4,420,409., Cl. 252-78.300.

Yosida, Akio: *See*—
Moriya, Shigeru; Yosida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Katsuno, Mitsuaki, 4,420,173., Cl. 280-804.000.

Young, Thornton J.: *See*—
Karol, James J.; and Young, Thornton J., 4,420,210., Cl. 339-94.00M.

Yuasa, Sakae: *See*—
Ueno, Haruo; Yano, Takefumi; Shimizu, Michimasa; Tamura, Masanori; and Yuasa, Sakae, 4,420,594., Cl. 526-128.000.

Yugen Kaisha Shindo Sessaku Kenkyusho: *See*—
Sotome, Tatuo; and Yokoi, Fumio, 4,419,912., Cl. 82-5.000.

Yuki, Nakaji; and Kitagawa, Hiroshi, to Director-General of Agency of Industrial Science & Technology. Process for the production of carbon molecular sieves. 4,420,415., Cl. 568-180.000.

Zabielski, Ray F. Centerline-attached looseleaf notebook page lifter. 4,420,271., Cl. 402-80.00L.

Zahn, Heinrich; and Falk, Gerhard, to Robert Bosch GmbH. Flutter compensated magnetic tape transducing drive apparatus. 4,420,109., Cl. 226-181.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; and Ishii, Kiyoto, 4,420,473., Cl. 424-118.000.

Zajber, Adolf G.: *See*—
Hoffmann, Rudolf; Zajber, Adolf G.; and Hansen, Herbert, 4,420,837., Cl. 373-78.000.

Zanker, Klaus J.; and Anderson, Gerald, to Sarasota Automation Limited. Method and apparatus for determining the mass flow of a fluid. 4,419,898., Cl. 73-861.020.

Zasio, John J., to Fujitsu Limited. Method of aligning electron beam apparatus. 4,420,691., Cl. 250-491.100.

Zavisza, Daniel M., to American Cyanamid Company. Polyurethane elastomers from hindered aliphatic diisocyanates. 4,420,600., Cl. 528-60.000.

Zelins, Ronald P.: *See*—
Martinez, Manuel; and Zelins, Ronald P., 4,420,125., Cl. 242-77.000.

Zerlik, Willibald, to BBC Brown, Boveri & Company, Limited. Electrical connection. 4,420,198., Cl. 339-5.00R.

Zilog, Inc.: *See*—
Hodge, Robin H.; and Brodsky, Mark A., 4,420,767., Cl. 357-81.000.

Zimmer, Ernst, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Method and apparatus for reproducibly associating two mechanical elements which are movable relative to each other. 4,419,831., Cl. 33-181.00R.

Zimmermann, Ulrich, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of enzymatically converting a substrate using membrane vesicles. 4,420,559., Cl. 435-99.000.

Zoleski, Benjamin H.: *See*—
Sung, Rodney L.; Zoleski, Benjamin H.; Cullen, William P.; and Kablaoui, Mahmoud S., 4,420,407., Cl. 252-33.400.

Zolotov, Lev A.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701., Cl. 310-54.000.

Zonco Federico & Figlio di Federico, Pietro e Placido Zonco S.n.c.: *See*—
Zonco, Placido; and Zonco, Maurizio, 4,419,871., Cl. 68-22.00R.

Zonco, Maurizio: *See*—
Zonco, Placido; and Zonco, Maurizio, 4,419,871., Cl. 68-22.00R.

Zonco, Placido; and Zonco, Maurizio, to Zonco Federico & Figlio di Federico, Pietro e Placido Zonco S.n.c. Fulling machine for textile material in continuous rope form or in hose form. 4,419,871., Cl. 68-22.00R.

Zuev, Vyacheslav S.: *See*—
Belkin, German S.; Voskresensky, Stal N.; Kiselev, Viktor Y.; Lukatskaya, Ida A.; Rodionov, Valery V.; Skurikhin, Mikhail N.; Frolova, Irina B.; Zuev, Vyacheslav S.; Kornevv, Lev I.; Chervonenkis, Rauza A.; Rabinovich, Efim M.; Volkova, Tatyana P.; and Goryaev, German A., 4,420,346., Cl. 148-4.000.

Zumfeld, Heinz: *See*—
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860., Cl. 57-22.000.
Rohner, Joachim; Zumfeld, Heinz; Mauries, Reinhard; and Preuhs, Hans-Jurgen, 4,419,858., Cl. 57-22.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF DECEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Automation Industries, Inc.: *See*—
McCormick, Larry L.; and Selk, Ben F., Re. 31,462., Cl. 339-90.00R.

Callery, Patrick S.: *See*—
Loberg, Michael D.; Callery, Patrick S.; and Cooper, Malcolm, Re. 31,463., Cl. 424-1.100.

Cooper, Malcolm: *See*—
Loberg, Michael D.; Callery, Patrick S.; and Cooper, Malcolm, Re. 31,463., Cl. 424-1.100.

Loberg, Michael D.; Callery, Patrick S.; and Cooper, Malcolm, to Research Corporation. Radiopharmaceutical chelates and method of external imaging. Re. 31,463., Cl. 424-1.100.

Martin, David O.; and Martin, Lawrence G., to Martin Overhead Door and Electronics Co. Method of preparing a section for an overhead door. Re. 31,461., Cl. 29-526.00R.

Martin, Lawrence G.: *See*—
Martin, David O.; and Martin, Lawrence G., Re. 31,461., Cl. 29-526.00R.

Martin Overhead Door and Electronics Co.: *See*—
Martin, David O.; and Martin, Lawrence G., Re. 31,461., Cl. 29-526.00R.

McCormick, Larry L.; and Selk, Ben F., to Automation Industries, Inc. Electrical connector. Re. 31,462., Cl. 339-90.00R.

Research Corporation: *See*—
Loberg, Michael D.; Callery, Patrick S.; and Cooper, Malcolm, Re. 31,463., Cl. 424-1.100.

Selk, Ben F.: *See*—
McCormick, Larry L.; and Selk, Ben F., Re. 31,462., Cl. 339-90.00R.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Callender, Maurice E.; and Jeffers, Thomas K., to Eli Lilly and Company. Anticoccidial combinations comprising nicarbazin and the polyether antibiotics. B1 4,218,438., 12-13-83, Cl. 424-251.000.

Clark, Steven D.: *See*—
Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Freeman, John E.; and Clark, Steven D., B1 4,360,288., Cl. 403-268.000.

Eli Lilly and Company: *See*—
Callender, Maurice E.; and Jeffers, Thomas K., B1 4,218,438., Cl. 424-251.000.

Fiberflex Products, Inc.: *See*—
Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Freeman, John E.; and Clark, Steven D., B1 4,360,288., Cl. 403-268.000.

Freeman, John E.: *See*—
Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Freeman, John E.; and Clark, Steven D., B1 4,360,288., Cl. 403-268.000.

Green, Philip S.; Saraf, Dilip G.; and Havlice, James F., to SRI International. Ultrasonic imaging method and apparatus with electronic beam focusing and scanning. B1 4,305,296., 12-13-83, Cl. 73-626.000.

Havlice, James F.: *See*—
Green, Philip S.; Saraf, Dilip G.; and Havlice, James F., B1 4,305,296., Cl. 73-626.000.

Jeffers, Thomas K.: *See*—
Callender, Maurice E.; and Jeffers, Thomas K., B1 4,218,438., Cl. 424-251.000.

Rutledge, Russell P.: *See*—
Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Freeman, John E.; and Clark, Steven D., B1 4,360,288., Cl. 403-268.000.

Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Freeman, John E.; and Clark, Steven D., to Fiberflex Products, Inc. Fiberglass sucker rod construction. B1 4,360,288., 12-13-83, Cl. 403-268.000.

Saraf, Dilip G.: *See*—
Green, Philip S.; Saraf, Dilip G.; and Havlice, James F., B1 4,305,296., Cl. 73-626.000.

SRI International: *See*—
Green, Philip S.; Saraf, Dilip G.; and Havlice, James F., B1 4,305,296., Cl. 73-626.000.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Araujo, Antonino, Jr., 271,798., Cl. D24-46.000.
Larkin, Mark E.; Tripp, Edward S.; and Ziegler, John S., 271,803., Cl. D24-58.000.
Larkin, Mark E.; Tripp, Edward S.; and Ziegler, John S., 271,805., Cl. D24-58.000.

Agfa-Gevaert AG: *See*—
Schlagheck, Norbert; and Rabold, Lutz, 271,777., Cl. D16-34.000.

Aldrich, Thomas, to Thermo-Tech Corp. Wind controlled sprayer unit. 271,790., 12-13-83, Cl. D23-18.000.

Alpha Enterprises, Inc.: *See*—
Hehn, Bruce A., 271,736., Cl. D6-184.000.

American Cyanamid Company: *See*—
Li, Lehmann K.; and Butter, Reinhart, 271,742., Cl. D8-48.000.

Applications Industrielles et Artistiques des Matieres Plastiques Apia: *See*—
Mabille, Pierre H. G.; and Perrin, Yannick A. R., 271,778., Cl. D19-64.000.

Araujo, Antonino, Jr., to Abbott Laboratories. Premature nipple or the like. 271,798., 12-13-83, Cl. D24-46.000.

Atkins, Ian, to Nolato AB. Urine collecting device for men. 271,799., 12-13-83, Cl. D24-51.000.

Axton, Hoyt W.; and Bailey, Corey B., to Sierra Survival Company, Inc. Flashlight. 271,808., 12-13-83, Cl. D26-37.000.

Axton, Hoyt W.; and Bailey, Corey B., to Sierra Survival Company, Inc. Flashlight. 271,809., 12-13-83, Cl. D26-37.000.

Axton, Hoyt W.; and Bailey, Corey B., to Sierra Survival Company, Inc. Flashlight. 271,810., 12-13-83, Cl. D26-37.000.

Bailey, Corey B.: *See*—
Axton, Hoyt W.; and Bailey, Corey B., 271,808., Cl. D26-37.000.
Axton, Hoyt W.; and Bailey, Corey B., 271,809., Cl. D26-37.000.
Axton, Hoyt W.; and Bailey, Corey B., 271,810., Cl. D26-37.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 271,811., Cl. D26-122.000.

Beekenkamp, Gerald; and Curtis, Donald. Playground equipment ladder. 271,785., 12-13-83, Cl. D21-244.000.

Beekenkamp, Gerald; and Curtis, Donald. Playground equipment step. 271,786., 12-13-83, Cl. D21-245.000.

Boeing Company, The: *See*—
Chamberlain, Michael J.; Myers, David R.; and Furlong, Donald R., 271,731., Cl. D6-114.000.

Borg-Warner Chemicals, Inc.: *See*—
Hardee, Carl L.; and Wagner, Robert E., 271,789., Cl. D23-2.000.

Borglum, Keith B. Vertically adjustable cantilevered grill. 271,740., 12-13-83, Cl. D7-332.000.

Braun, Hans: *See*—
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 271,811., Cl. D26-122.000.

Brendling, Lennart I., to Landstingens Inkopscentral, Lic. Male incontinence pad. 271,800., 12-13-83, Cl. D24-51.000.

Brittner, Frank W., to J & J Snack Food Corp. Display case. 271,735., 12-13-83, Cl. D6-172.000.

Brown, Wilbert C.; and Pomponi, Roman F., to TIE/Communications, Inc. Direct station selection console. 271,763., 12-13-83, Cl. D14-66.000.

Burns, David W. Rocking chair. 271,728., 12-13-83, Cl. D6-49.000.

Butter, Reinhart: *See*—
Li, Lehmann K.; and Butter, Reinhart, 271,742., Cl. D8-48.000.

Campana, Alfred, to Florists' Transworld Delivery Association. Floral container. 271,751., 12-13-83, Cl. D11-151.000.

Campbell, David L.: *See*—
Patterson, Thomas C.; and Campbell, David L., 271,759., Cl. D12-158.000.

Cannondale Corporation: *See*—
Patterson, Thomas C.; and Campbell, David L., 271,759., Cl. D12-158.000.

Carbajales Santa-Eulalia, Javier B.: *See*—
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 271,752., Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Co., Inc. Figurine of a Collie pup. 271,752., 12-13-83, Cl. D11-158.000.

Caskey, Margaret; and Jernigan, Doyle D., to Wood-Arts Company, Inc. Golf club head. 271,784., 12-13-83, Cl. D21-220.000.

Chamberlain, Michael J.; Myers, David R.; and Furlong, Donald R., to Boeing Company, The. Folding wall-mounted seat. 271,731., 12-13-83, Cl. D6-114.000.

Chrones, Anthony, to Gerber Products Company. Nipple for a screw cap bottle. 271,797., 12-13-83, Cl. D24-46.000.

Claxton, Bruce A.: *See*—
Eckmann, John A.; and Claxton, Bruce A., 271,766., Cl. D14-86.000.

Collin, Pierre, to Spontex Societe Anonyme. Sponge. 271,817., 12-13-83, Cl. D32-40.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Nagata, Kazuo, 271,795., Cl. D23-148.000.

Compagnie Generale des Etablissements Michelin: *See*—
Gorez, Jean-Philippe, 271,756., Cl. D12-147.000.
Ricquet, Joel, 271,755., Cl. D12-147.000.

Cordis Dow Corp.: *See*—
Preussner, Andreas, 271,801., Cl. D24-51.000.
Preussner, Andreas, 271,802., Cl. D24-51.000.

Cragin, Richard, to Textron Inc. Fork or similar article of flatware. 271,738., 12-13-83, Cl. D7-137.000.

Curtis, Donald: *See*—
Beekenkamp, Gerald; and Curtis, Donald, 271,785., Cl. D21-244.000.
Beekenkamp, Gerald; and Curtis, Donald, 271,786., Cl. D21-245.000.

Custom Craft Pickup Covers Corporation: *See*—
Miller, William A., 271,757., Cl. D12-156.000.

Daenen, Robert H. C. M.; and Herlow, Erik, to Dart Industries Inc. Ice cube tray. 271,769., 12-13-83, Cl. D15-90.000.

Daimler-Benz Aktiengesellschaft: *See*—
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Dart Industries Inc.: *See*—
Daenen, Robert H. C. M.; and Herlow, Erik, 271,769., Cl. D15-90.000.

Daventry, Roger. Mobile storage unit. 271,733., 12-13-83, Cl. D6-166.000.

Dodrill, Richard W. Adjustable bed. 271,729., 12-13-83, Cl. D6-84.000.

Drake, Craig D., to Ring King Visibles, Inc. Storage tray for printwheels. 271,726., 12-13-83, Cl. D3-74.000.

DuBois, R. Clark; and Hamma, John C., to Gradco/Dendoki, Inc. Copying and sorting apparatus. 271,775., 12-13-83, Cl. D16-31.000.

Durst A.G. Fabrik Fototechnischer Apparate: *See*—
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Eckmann, John A.; and Claxton, Bruce A., to Motorola, Inc. Portable radio whip antenna or similar article. 271,766., 12-13-83, Cl. D14-86.000.

Eckmann, John A.: *See*—
Toth, Richard J.; and Eckmann, John A., 271,764., Cl. D14-68.000.

Ekelund, Bo, to Dynapac Maskin AB. Poker vibrator electric drive unit. 271,773., 12-13-83, Cl. D15-147.000.

Eldon Industries, Inc.: *See*—
Riccio, Ronald, 271,741., Cl. D8-30.000.

Elliott, Quenton T.; and Elliott, Quenton T., Jr. Belt. 271,724., 12-13-83, Cl. D2-385.000.

Elliott, Quenton T., Jr.: *See*—
Elliott, Quenton T.; and Elliott, Quenton T., Jr., 271,724., Cl. D2-385.000.

Ervin, Dennis L. Bicycle mounted carrying case. 271,758., 12-13-83, Cl. D12-158.000.

Extraversion, Inc.: *See*—
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Fabridyne, Inc.: *See*—
Sommerfeld, John E., 271,768., Cl. D15-27.000.

Finley, Randall B. Ammo pouch. 271,787., 12-13-83, Cl. D22-14.000.

Florists' Transworld Delivery Association: *See*—
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Ford, John M. B.: *See*—
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Formtechnik: *See*—
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Chamberlain, Michael J.; Myers, David R.; and Furlong, Donald R., 271,731., Cl. D6-114.000.

Galoob, David. Gum machine. 271,781., 12-13-83, Cl. D21-109.000.

Gerber Products Company: *See*—
Chrones, Anthony, 271,797., Cl. D24-46.000.

Gillette Company, The: *See*—
Gray, Michael J., 271,813., Cl. D28-46.000.

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Jansen, Lawrence G.; Robinson, Beale A.; Ruip, Terrence M.; and Struhsaker, John C., 271,754., Cl. D12-146.000.

Gorez, Jean-Philippe, to Compagnie Generale des Etablissements Michelin. Tire. 271,756., 12-13-83, Cl. D12-147.000.

Gradco/Dendoki, Inc.: *See*—
DuBois, R. Clark; and Hamma, John C., 271,775., Cl. D16-31.000.

Gray, Michael J., to Gillette Company, The. Razor. 271,813., 12-13-83, Cl. D28-46.000.

Green, David T., to United States Surgical Corporation. Disposable staple cartridge for linear closure surgical stapler. 271,796., 12-13-83, Cl. D24-27.000.

Grohowski, Timothy E.; and Wheeler, Randall W. Grinding fixture. 271,772., 12-13-83, Cl. D15-140.000.

GTE Products Corporation: *See*—
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Hamma, John C.: *See*—
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Hardee, Carl L.; and Wagner, Robert E., to Borg-Warner Chemicals, Inc. Hatch cover with pneumatic seal for mobile or stationary storage tanks. 271,789., 12-13-83, Cl. D23-2.000.

Hartman, Robert G., to Zarn, Inc. Trash can cover. 271,818., 12-13-83, Cl. D34-11.000.

Hashimoto, Minoru; Nomura, Yoshiyuki; and Kubo, Masayoshi, to Matsushita Electric Industrial Co., Ltd. Video disc player. 271,761., 12-13-83, Cl. D14-1.000.

Healy, Mark, to Senninger Irrigation, Inc. Irrigation spray nozzle. 271,791., 12-13-83, Cl. D23-35.000.

Hehn, Bruce A., to Alpha Enterprises, Inc. Combined bookrack and holder for writing implements and coins. 271,736., 12-13-83, Cl. D6-184.000.

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Hirose, Etsuro: *See*—
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Hite, Harry W. Lead release for fishing with fly rod. 271,788., 12-13-83, Cl. D22-23.000.

Hoosier Racing Tire Corporation: *See*—
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Huck, Joel C. Image frame. 271,737., 12-13-83, Cl. D6-234.000.

Ichikawa Press Industry Co., Ltd.: *See*—
Yabata, Hisao, 271,806., Cl. D26-29.000.

Ishii, Yoshiyasu: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Nagata, Kazuo, 271,795., Cl. D23-148.000.

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Jansen, Lawrence G.; Robinson, Beale A.; Ruip, Terrence M.; and Struhsaker, John C., to Goodyear Tire & Rubber Company, The. Tire tread and buttress. 271,754., 12-13-83, Cl. D12-146.000.

Jernigan, Doyle D.: *See*—
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Johnston, Joseph E.: *See*—
Lucas, George W., Jr.; Johnston, Joseph E.; and Rodis-Janero, Nilo, 271,780., Cl. D21-87.000.

Kanise, Yukio, to Yakult Honsha Co., Ltd. Bottle. 271,747., 12-13-83, Cl. D9-349.000.

Karosi, Ernest J., to Textron Inc. Jar cap. 271,750., 12-13-83, Cl. D9-436.000.

Kasai, Hajime: *See—*
Oosawa, Takao; Nishiyama, Joji; Kasai, Hajime; and Hirose, Etsuro, 271,815., Cl. D32-6.000.
Katsumi, Hirosuke: *See—*
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Kono, Michinaga; Matsumoto, Yoshio; Katsumi, Hirosuke; and Fukuchi, Fumio, to Hitachi, Ltd. Industrial robot. 271,770., 12-13-83, Cl. D15-122.000.
Kramer, Peter R.: *See—*
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Kubo, Masayoshi: *See—*
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NOTE.—First number, class; second number, subclass; third number, patent number

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72 B 4,420,653
92 4,420,654

CLASS 175

45 4,420,049
374 4,420,050

CLASS 177

25 4,420,051
132 4,420,052
139 4,420,053
154 4,420,054
212 4,420,055
245 4,420,056

CLASS 179

6.04 4,420,656
156 A 4,420,657

CLASS 180

54 A 4,420,057
68 P 4,420,058
248 4,420,059
300 4,420,060

CLASS 181

166 4,420,061
204 4,420,062
229 4,420,063

CLASS 184

1 C 4,420,064

CLASS 188

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107 4,420,066
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CLASS 190

102 4,420,068

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35 4,420,069
48.8 4,420,070
134 4,420,071
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347 4,420,073
735 4,420,075

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67 A 4,420,659
144 B 4,420,661
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148 R 4,420,662
159 B 4,420,663
302 4,420,665
308 4,420,664
340 4,420,666

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CLASS 204

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35 N 4,420,378
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66 4,420,380
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180 G 4,420,383
4,420,384
192 N 4,420,386
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263 4,420,387

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45.14 4,420,077
305 4,420,078
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538 4,420,083
566 4,420,084
571 4,420,085

CLASS 208

112 4,420,388
251 R 4,420,389

CLASS 209

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403 4,420,391

CLASS 210

86 4,420,392
101 4,420,393
169 4,420,394
263 4,420,395
416.4 4,420,396
611 4,420,397
641 4,420,398
700 4,420,399
710 4,420,400
714 4,420,401
783 4,420,402
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808 4,420,404

CLASS 211

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189 4,420,087

CLASS 213

50.5 4,420,088

CLASS 215

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121 LM 4,420,675
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492 4,420,683

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174.11 4,420,411
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522 R 4,420,423

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242 4,420,695
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628 4,420,708

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CLASS 333

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351 4,420,260
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81 4,420,767

CLASS 358

107 4,420,768
139 4,420,769
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261 4,420,771
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28 4,420,774
38.1 4,420,775
45 4,420,776
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92 4,420,779
103 4,420,780
112 4,420,781
129 4,420,782
137 4,420,783

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7 4,420,784
56 4,420,785
77 4,420,786
79 4,420,787
85 4,420,788
94 4,420,789
283 4,420,790
319 4,420,791
331 4,420,792
413 4,420,793
419 4,420,794
427 4,420,795

CLASS 362

32 4,420,796
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216 4,420,799
297 4,420,800
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369 4,420,803

CLASS 363

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CLASS 364

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200 4,420,806
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513 4,420,812
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565 4,420,814
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CLASS 366

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167 4,420,826

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80 4,420,263
223 4,420,264

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CLASS 412

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539 4,420,286
729 4,420,287

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CLASS 422

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201 4,420,462
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311 4,420,491
326 4,420,484

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407.1 4,420,513
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35 4,420,516
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DESIGN PATENTS

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